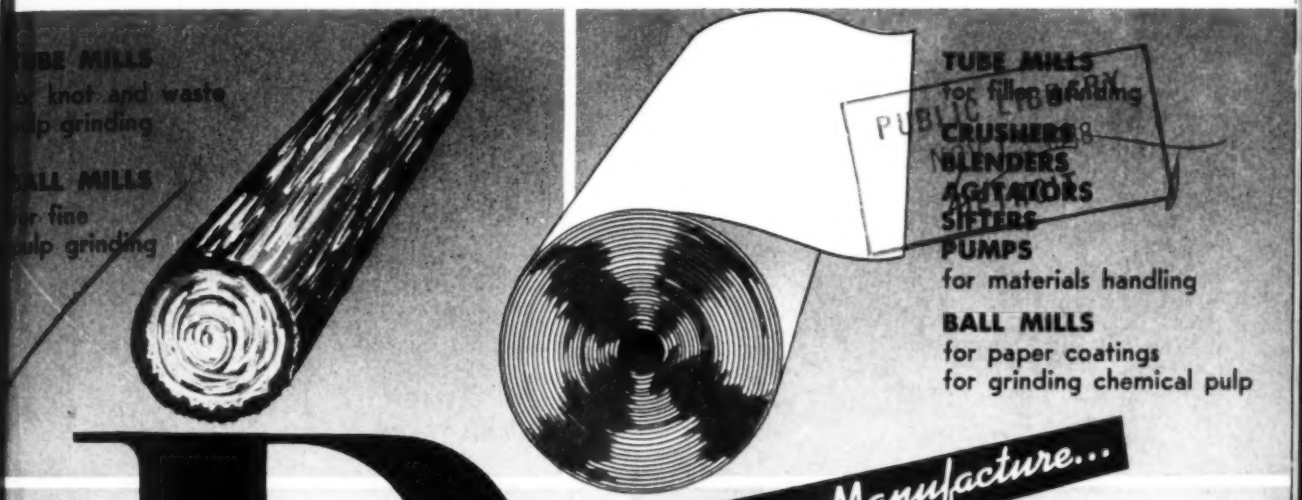
THE PAPER INDUSTRY and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE — AUGUST, 1948



TUBE MILLS
for knot and waste pulp grinding

BALL MILLS
for fine pulp grinding

TUBE MILLS
for filler grinding

CRUSHERS
BLENDERS
AGITATORS
SIFTERS
PUMPS
for materials handling

BALL MILLS
for paper coatings
for grinding chemical pulp

in Paper Manufacture...

SATISFACTORY PATTERSON MACHINERY

Patterson SATISFACTORY Machinery

DOES A STEADILY PROFITABLE JOB!

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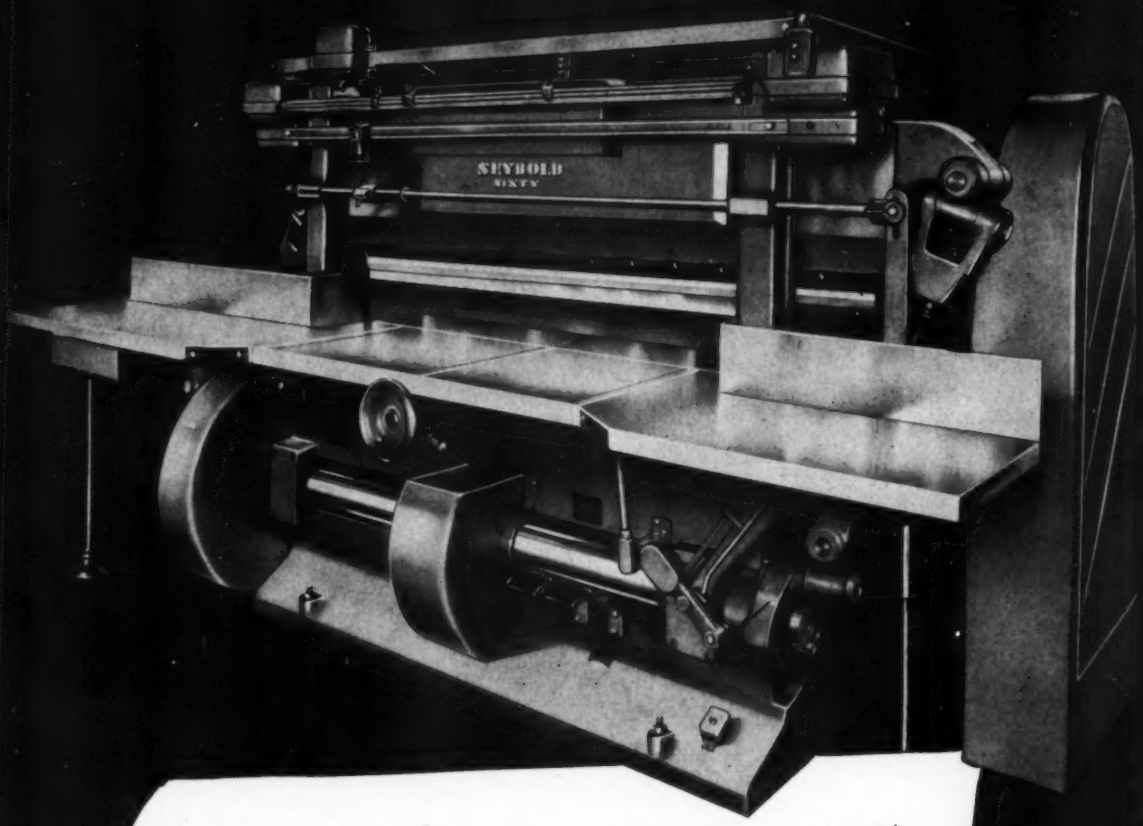

INCREASED MACHINE TONNAGE may not necessarily mean that you must increase the number of trimmers in your finishing room to keep production in balance. Some mills are learning this: *With new Seybold "Sixty" Spacer-Trimmers on the job, actually fewer trimmers are needed to handle more work! And valuable floor space is saved, too.* It will pay you to investigate production records being established by Seybold "Sixty" Mill Spacer-Trimmers.

HARRIS-SEYBOLD

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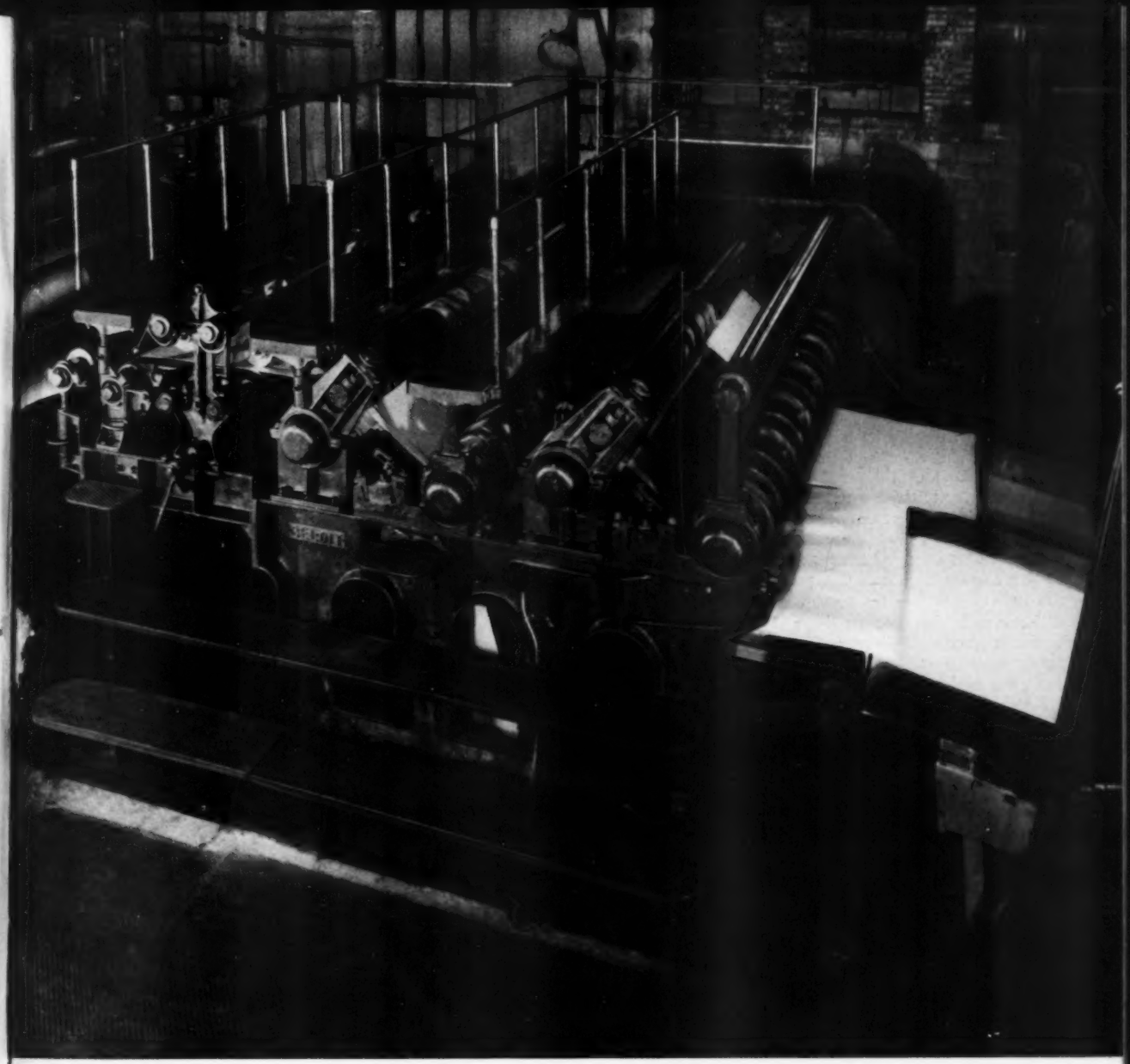
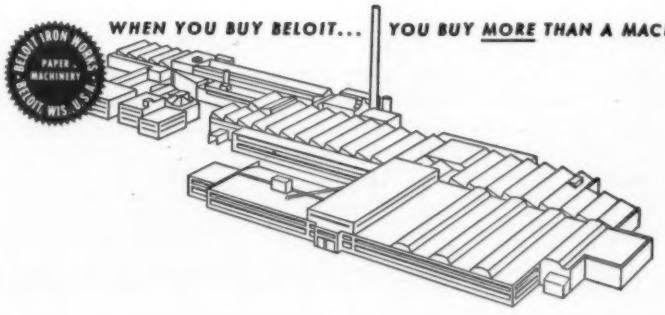


Production pace-setter

Duplex slitter can be changed without breaking down the sheet in the Beloit Duplex Cutter and Slitters recently installed in the Hummel and Downing Company mill at Milwaukee, Wisconsin. Other features of this installation, pictured above, are anti-friction bearings, new-type revolving bar design to prevent entraining air, and improved positive adjustments on knife and bed bar.—*Beloit Iron Works, Beloit, Wis.*



WHEN YOU BUY BELOIT... YOU BUY MORE THAN A MACHINE!

BELOIT

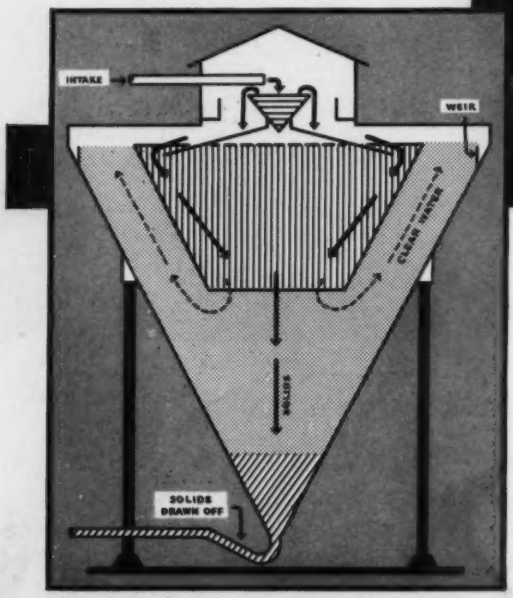
PAPER MACHINERY

97.4%

OF FIBROUS SOLIDS REMOVED FROM WASTE WHITE WATER

The Marx Saveall shown at the right was recently erected at a paper boxboard mill to clarify the white water effluent from the paper machines prior to its re-use or discharge. A recent report shows that this Saveall is 97.4 per cent effective . . . reducing suspended fibrous solids in the waste water from 4.66 lbs. per 1,000 gals. to 0.10 lbs.

The clarification process in a Marx Saveall is accomplished by settling. The diagrammatic sketch below illustrates the manner in which it operates.



Marx Savealls are typical examples of the special steel plate structures we design, fabricate and erect for industrial plants. Let our engineers work with you on your next steel plate work requirements.

HOW THE MARX SAVEALL WORKS

THE Marx Saveall consists primarily of two large steel plate cones, one mounted inside the other as shown at the left. The inner cone has a large opening at the bottom.

There is a small cone-shaped receiving well at the top and an inverted de-aeration cone directly under the receiving well. Waste white water from the paper board machines is fed into the receiving well at the top, overflows in a thin film onto the de-aeration cone where the air bubbles are shaken loose from the solid particles, and then flows over the cone's outer edge and into the center of the unit. The suspended solids settle through the bottom of the inside cone, collect in the bottom of the outside cone and are drawn off and fed into a continuous beater for re-use. The water, minus most of the solids, rises between the two cones and overflows into a weir at the top of the outer cone. From there it is piped to storage tanks for re-use in the beater room or it is discharged into a nearby stream.

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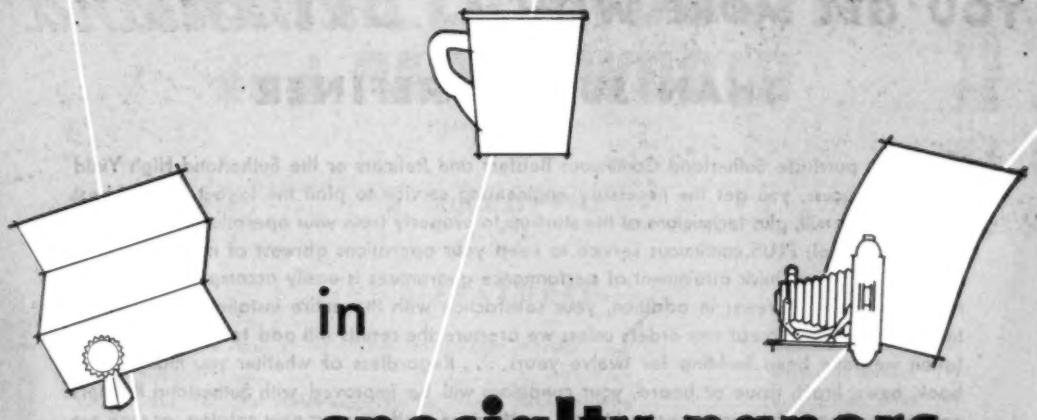

in specialty papers the trend is to

HERCULES staybelite size

In the manufacture of specialty papers, such as those for hot beverage cups, permanent manuscripts, and light-sensitive papers, more and more paper mills are benefiting from Staybelite* Size. Produced from Hercules hydrogenated rosin, Staybelite Size gives maximum brightness and permanency and a minimum of taste and odor to paper. This high-quality product is another example of Hercules applied research in the paper industry.

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THE PAPER INDUSTRY and PAPER WORLD

(Reg. U. S. Pat. Off.)

VOLUME 30 - - - - AUGUST, 1948 - - - - NUMBER 5

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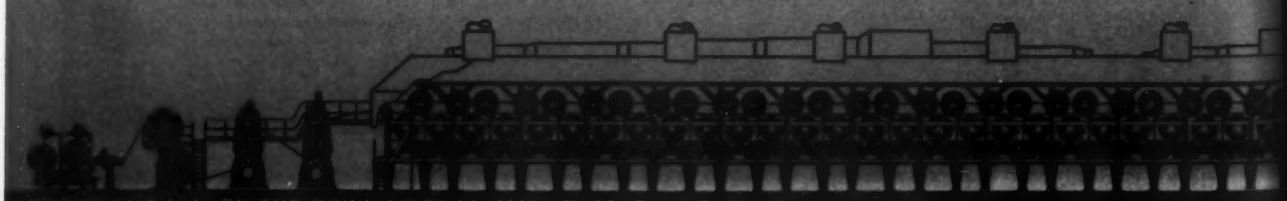

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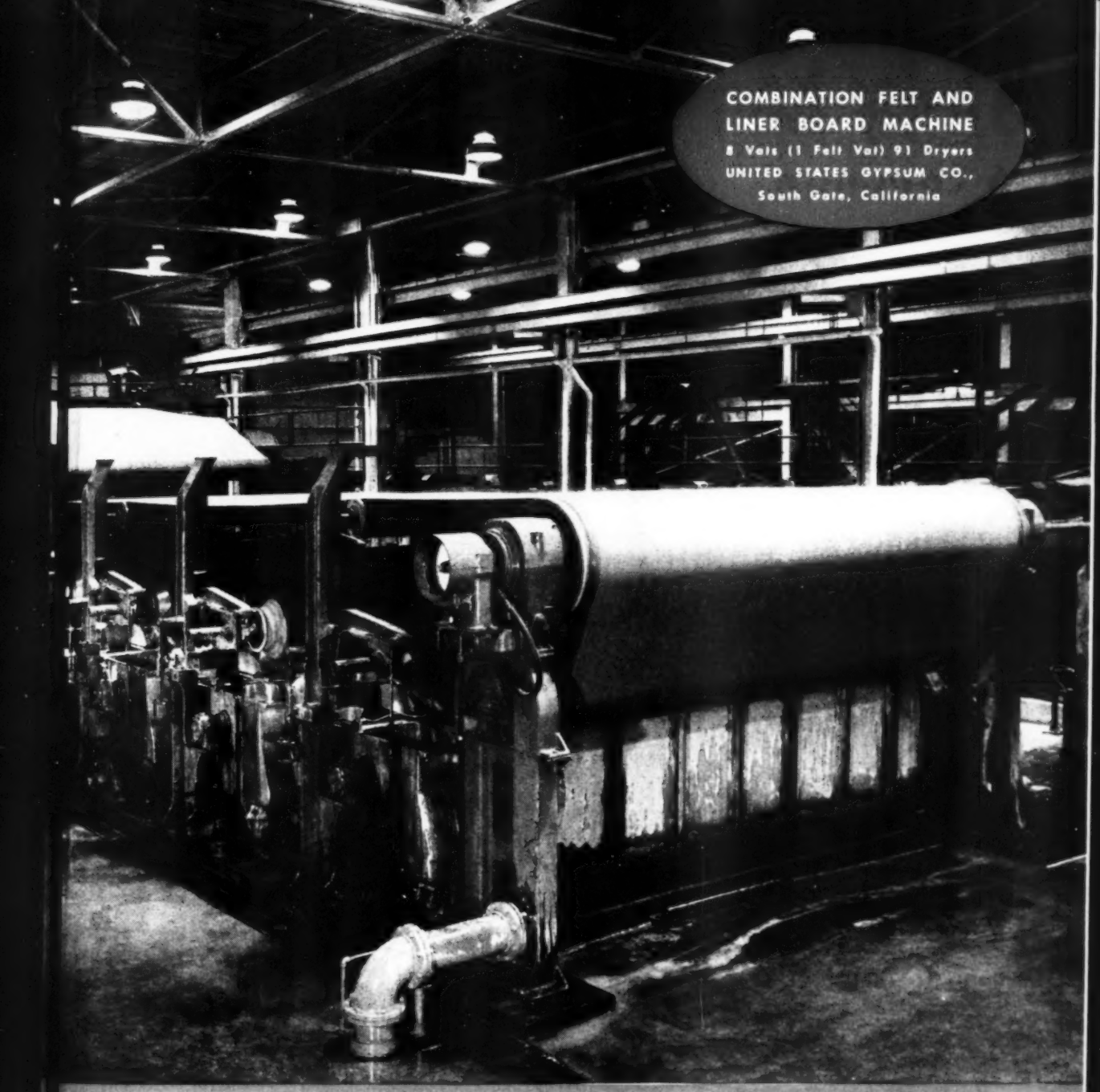

COMBINATION FELT AND LINER BOARD MACHINE
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Felt and Liner Board Machine and —10 Vats (1 Felt Vat) 124 Dryers

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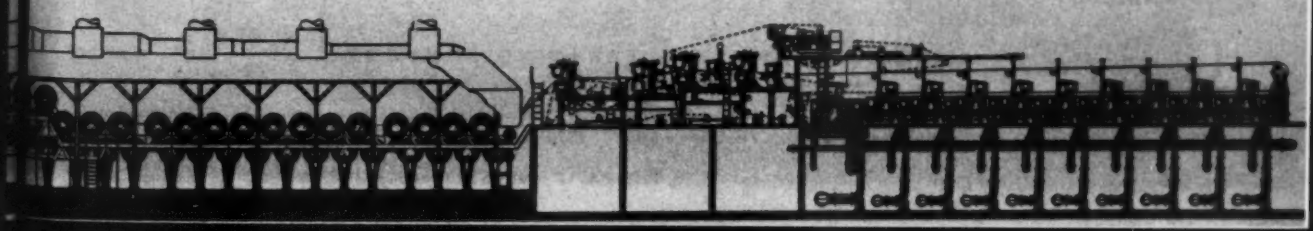

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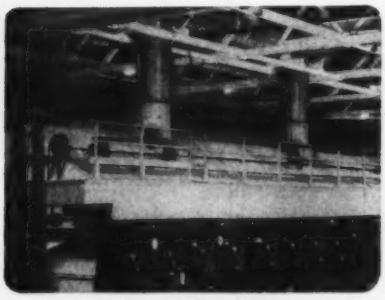
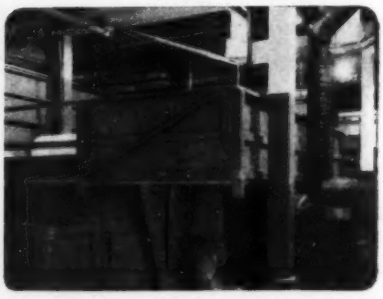
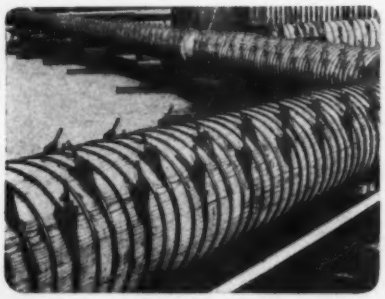
2. Roof decks subject to rapid decay caused by excessive humidity.



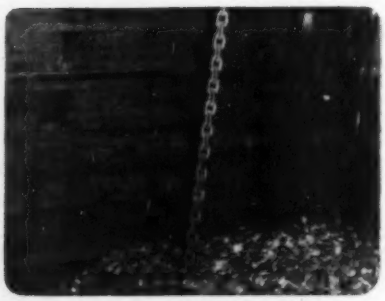
3. Where steam and vapor from industrial processes are prevalent.



4. Mixing tanks and equipment exposed to water contact.



5. Where combinations of outdoor exposure and water contact are present.



6. Walls and floors of bins subject to decay caused by moisture condensation.

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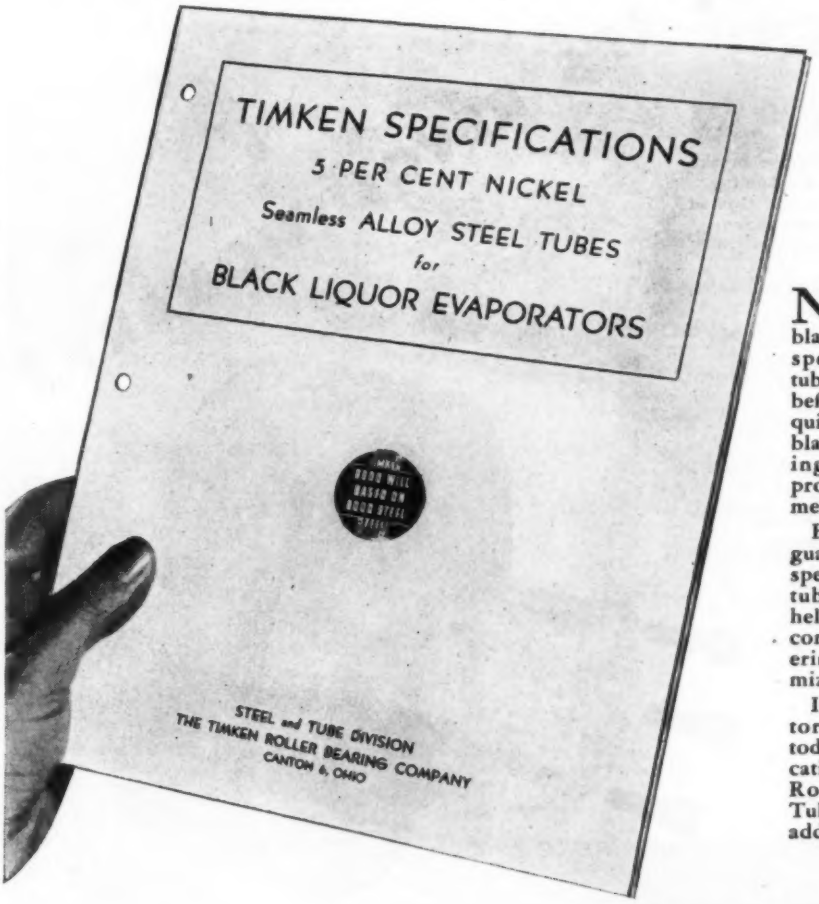

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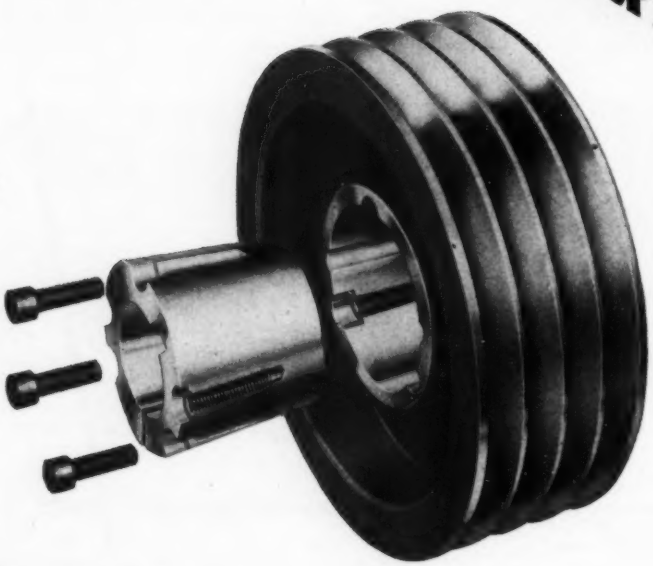

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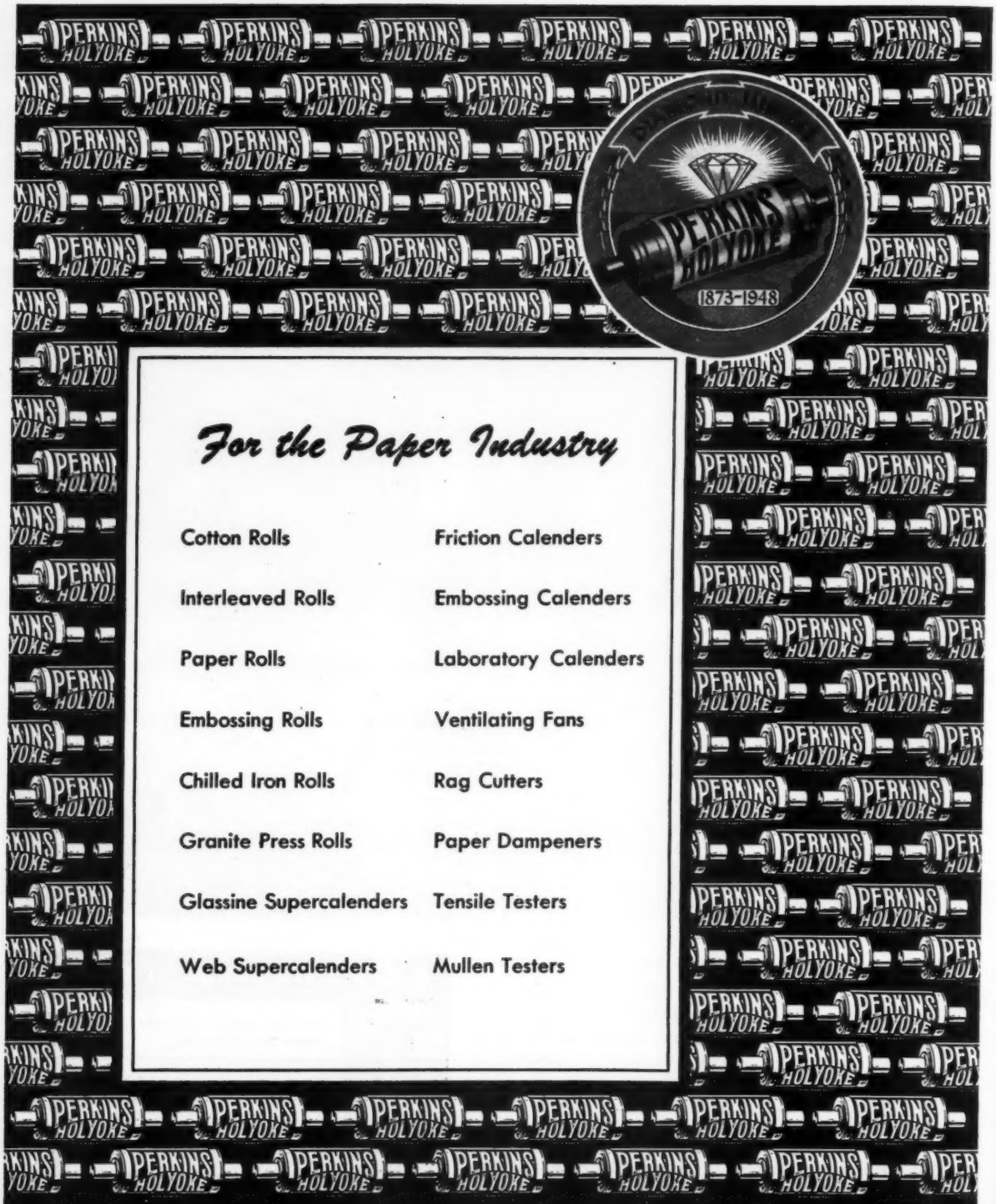

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takes more than good weather and a fair wind...

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Fig. 559—125-pound Iron Body Bronze Mounted Swing Check Valve. Flanged ends, bolted flanged cap and regrindable, renewable bronze seat and disc.

Fig. 241—Large 125-pound Iron Body Bronze Mounted Globe Valve. Made in sizes 2" to 16", inclusive. Has outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc. Also available in All Iron. ➡

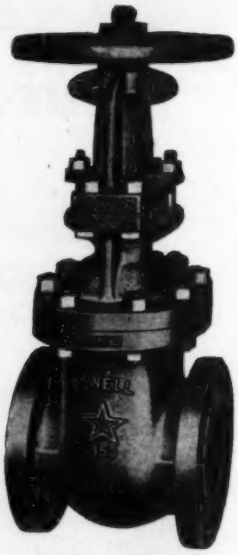

Fig. 1503—Class 150-pound Cast Steel Gate Valve with flanged ends, bolted flanged yoke, outside screw rising stem, tapered solid wedge.

Fig. 1816—Large 125-pound All Iron Gate Valve. Made in sizes 2" to 30", incl. Has bolted flanged yoke, outside screw rising stem and tapered solid wedge.

The Wm. Powell Co., Cincinnati 22, Ohio

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POWELL VALVES

We're forced to admit it

From time to time we have modestly let it be known that things are going well at Moore & White. Without fanfare, then—although we are sorely tempted—we submit a few bald but significant statistics.

Business on Moore & White books is ten times what it was when new management took the reins two years ago. Accounts are ten times the number then . . . new customers, and many old ones who have returned to the fold, bringing their major paper-making problems with them.

Productive floor space has been doubled in those two years. Existing equipment has been thoroughly modernized and supplemented by new machine tools where needed to create a well-balanced production set-up. Personnel—more than quadrupled—includes a new team of seasoned engineers and sales-engineers whose competence is well known and respected in the paper-making industry.

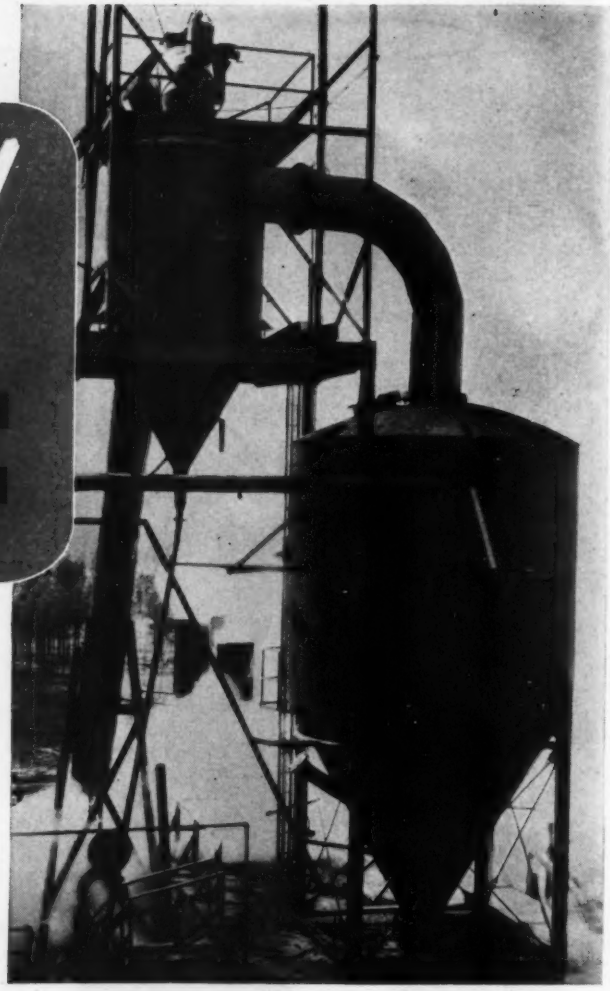
We can't stress the magnitude of our backlog without facing-up to the matter of deliveries. They're better than you might suppose. Finished work is leaving our plant in ever-increasing volume. We'll do our level best to meet *your* requirements.

The MOORE & WHITE Company

15TH STREET AND LEHIGH AVENUE • PHILADELPHIA 32, PA.

CUSTOM-BUILT MACHINES FOR MAKERS OF PAPER AND PAPERBOARD

Armored AGAINST EROSION AND CORROSION



Stainless-Clad Steel was used for the wear plates of this Cyclone, built by Florida Pulp & Paper Company for installation in its Pensacola, Florida, plant.

Type 304 stainless steel is highly resistant to the erosive and corrosive action of caustic-laden steam blown into this cyclone. Employed here as 20% of the thickness of the Lukens Stainless-Clad Steel wear plates, it provides both protection and structural strength with economy.

In pulp and paper processing, Lukens Clad Steels offer these advantages: no rusting to contaminate products, long life for digesters, tanks and other equipment, *solid* corrosion-resistant metal protection with *clad* steel economy. Lukens Nickel-Clad Steel satisfies certain requirements, while Stainless-Clad, Inconel-Clad and Monel-Clad take care of others.

Now available in the extra smooth, Sodium Hydride Finish, Lukens Clad Steels are easy to keep clean and minimize sliming. Claddings 10% or 20% of total plate thickness suit most requirements. Lukens offers the widest range of clad steels available from any source—a uniform cladding permanently bonded to a steel backing plate, in thicknesses to over 3" or as wide as 178".

Bulletins 255 and 338 contain data on all Lukens Clad Steels. For copies, write Lukens Steel Company, 408 Lukens Building, Coatesville, Penna.

CLAD METAL STEEL

LUKENS

Nickel-Clad Stainless-Clad
Inconel-Clad Monel-Clad
STEELS

SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

...proves tops for this job

A sizzling 300°F. to a chilly 45°F.—that's the temperature range of the various conveyor bearings on the brazing oven and cooler illustrated above. Yet Stanobar Grease is used on all 350 bearings in the unit.

This grease has a high melting point, so that on the hot bearings it resists thinning out and does not separate. At the same time Stanobar maintains a smooth, workable consistency on the cool bearings. As a result, all bearings are protected against wear, dirt and moisture at all times.

Stanobar Grease can reduce lubricating cost on the many anti-friction bearings in motors and machines in your plant. Two grades are available, for application either by grease gun or through central lubricating systems. Ask for the services of the Standard Oil Lubrication Engineer in your midwest locality. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANOBAR GREASE

STANDARD OIL COMPANY (INDIANA) STANDARD

Check and Double Check

You can't figure felt costs from the price lists of felt manufacturers. Use your own felt book.

Felt, Steam and *Time* are the only direct manufacturing costs from the press to the winder of your machine.

The more water you remove at the felt the less steam and the less time you need at the driers. Result—more tonnage at less cost.

From the thinnest tissue to the heaviest board there is a Hamilton Felt that will cost less per ton of production.

This statement takes in a lot of territory but it is subject to proof in your own mill and to check and double check in your felt book.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

Why say Size . . .

when PROSIZE

OFFERS SO MANY BIG ADVANTAGES?

● Prominent mills with a total production of thousands of tons of paper a day have found in the Glidden Prosize Process such a superior means of sizing, we are confident that you will want to try it soon. Specifically, on changing from conventional rosin size users have reported that:

—Prosize Process is 200 to 300% more efficient.

—Prosize Process produces a better, more stable size which gives paper uniform resistance to liquids of various types, such as ink, water, meat juices, etc.

—Prosize Process permits duplication of results from run to run on grades never before made because of sizing difficulties.

—Prosize Process minimizes seasonal variations — is highly effective on stocks heated by long beating or hard jordaning.

—Prosize Process permits sizing at a higher or more neutral pH.

—Prosize Process requires from 35 to 65% less rosin size and from 15 to 30% less alum, making it generally *less expensive* to use.

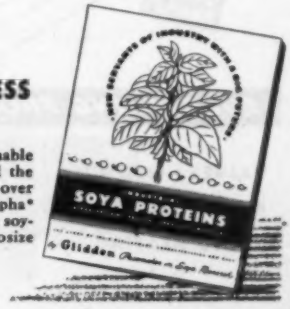
The Glidden Company
SOYA PRODUCTS DIVISION
5165 West Moffat St. • Chicago 39, Illinois

QUALITY Glidden PRODUCTS

MORE ABOUT THE PROSIZE PROCESS IN THIS NEW, FREE BOOK!

Concise yet complete, profusely illustrated . . . this valuable new book on Industrial Soya Proteins gives you all the "whys" of the many advantages of the Prosize Process over conventional methods. Also has a chapter on Glidden Alpha* Protein, the pure protein chemically isolated from the soybean which forms the basic ingredient of the Prosize Process. Write for it today!

*Trade Mark Registered



For complete piping needs see the complete CRANE line

Process piping . . . power plant . . . heating system. Whatever your needs in piping equipment, you can fill them from the complete Crane line. One order covers everything—valves, fittings, pipe, accessories, including shop-fabricated piping assemblies. One order gives you dependable quality in every single item.

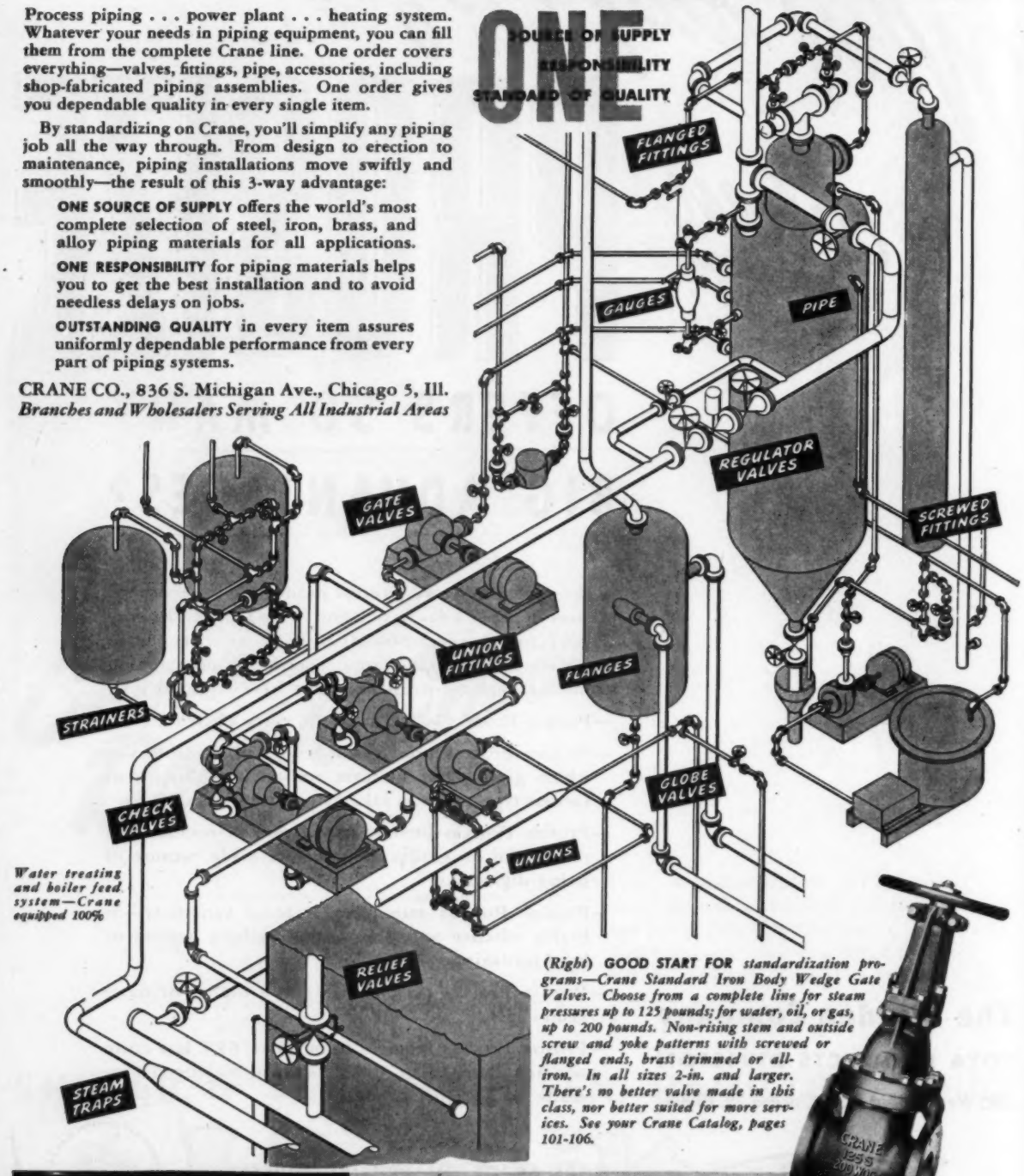
By standardizing on Crane, you'll simplify any piping job all the way through. From design to erection to maintenance, piping installations move swiftly and smoothly—the result of this 3-way advantage:

ONE SOURCE OF SUPPLY offers the world's most complete selection of steel, iron, brass, and alloy piping materials for all applications.

ONE RESPONSIBILITY for piping materials helps you to get the best installation and to avoid needless delays on jobs.

OUTSTANDING QUALITY in every item assures uniformly dependable performance from every part of piping systems.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas



Water treating and boiler feed system—Crane equipped 100%

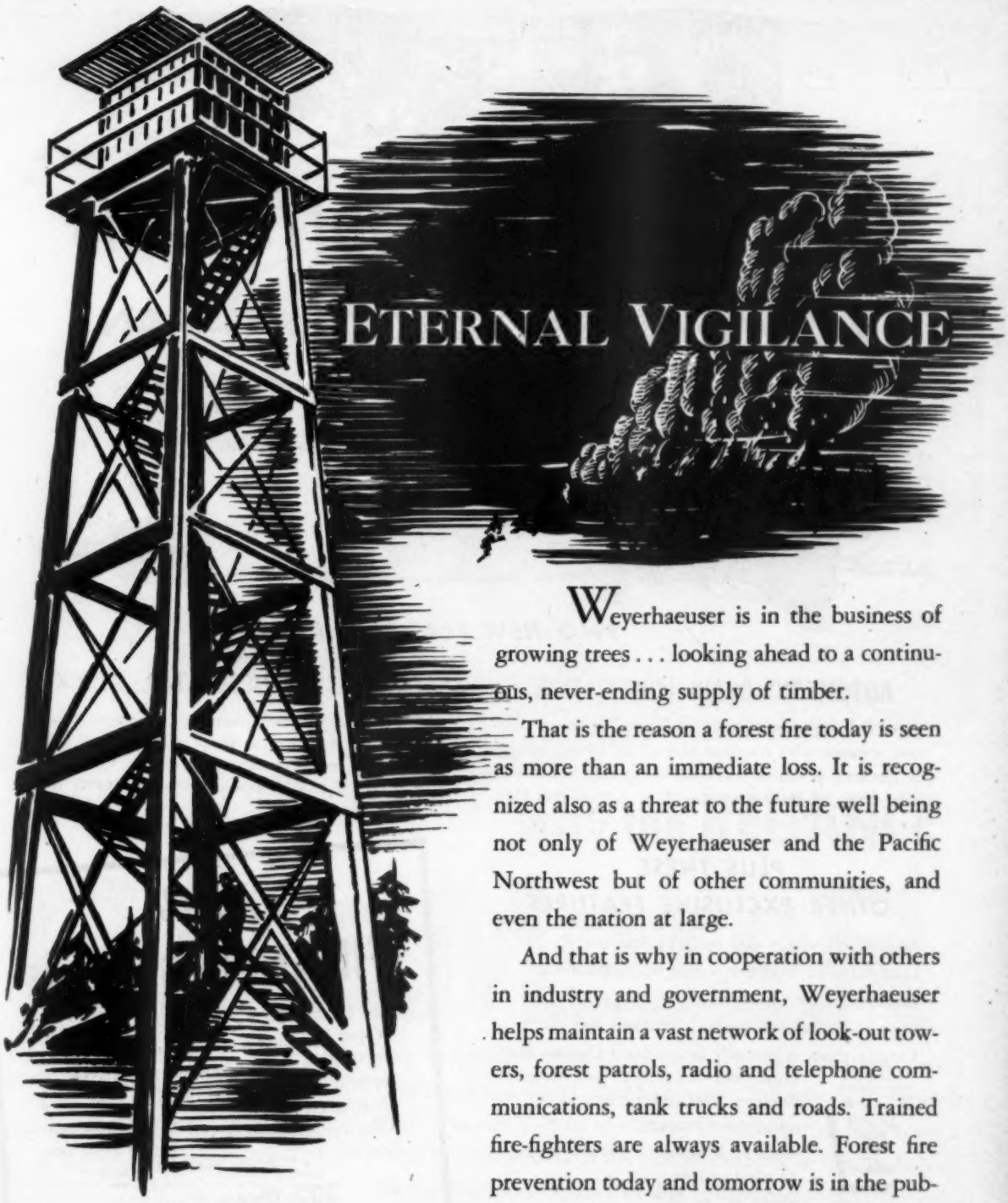
(*Right*) **GOOD START FOR** *standardization programs—Crane Standard Iron Body Wedge Gate Valves. Choose from a complete line for steam pressures up to 125 pounds; for water, oil, or gas, up to 200 pounds. Non-rising stem and outside screw and yoke patterns with screwed or flanged ends, brass trimmed or all-iron. In all sizes 2-in. and larger. There's no better valve made in this class, nor better suited for more services. See your Crane Catalog, pages 101-106.*

EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

CRANE

FOR EVERY PIPING SYSTEM



Weyerhaeuser is in the business of growing trees . . . looking ahead to a continuous, never-ending supply of timber.

That is the reason a forest fire today is seen as more than an immediate loss. It is recognized also as a threat to the future well being not only of Weyerhaeuser and the Pacific Northwest but of other communities, and even the nation at large.

And that is why in cooperation with others in industry and government, Weyerhaeuser helps maintain a vast network of look-out towers, forest patrols, radio and telephone communications, tank trucks and roads. Trained fire-fighters are always available. Forest fire prevention today and tomorrow is in the public interest for the present and the future.

PULP DIVISION

WEYERHAEUSER

NOW on EASY CREDIT TERMS

DISSTON HEAVY-DUTY TWO-MAN CHAIN SAW

with Mercury Gasoline Engine

TWO NEW FEATURES ADDED

AUTOMATIC CHAIN LUBRICATION

Improved engine-end chain lubrication provides positive pressure with constant flow of oil in any felling or bucking position. Prevents clogging. Automatically shuts off the instant clutch is disengaged. Has no exposed oil lines.

"CRADLE BALANCED" TAIL STOCK

Stronger, narrower, more compact. Tough aluminum construction. Fulcrum at front end provides better leverage and easier maneuvering in cut. Completely encased for safety. Simplified tension meets individual requirements.

PLUS THESE OTHER EXCLUSIVE FEATURES

All controls within easy reach of operator.

Detachable air filter keeps dust from carburetor.

Die cast engine cylinders.

Positive-acting, non-slipping, multiple disc clutch.

Cutting chain is specially heat-treated Disston Steel.

Guide rail of hardened and tempered Disston Steel, reversible end for end and top for bottom.

Built-in Magnapull starter; no ropes to wind or lose.

Sizes, 24" to 84."

WHEN YOU BUY A DISSTON PRODUCT YOU BUY DISSTON STEEL SKILL and SERVICE

AVAILABLE *NOW*

Get in touch with your Disston Chain Saw Dealer

NEW FINANCING PLAN

The Disston Time Payment Plan, serviced by Walter E. Heller & Co., installment experts, provides a sound, generous, easy-to-pay method of financing the purchase of a Disston Heavy-Duty Two-Man Chain Saw. Take advantage of this plan. Get your unit now and let it go to work for you.

20% Down Payment
(For 36" Model At Present Prices)

$131.00 DOWN

APPROX. $48.00 PER MONTH

12 MONTHS TO PAY

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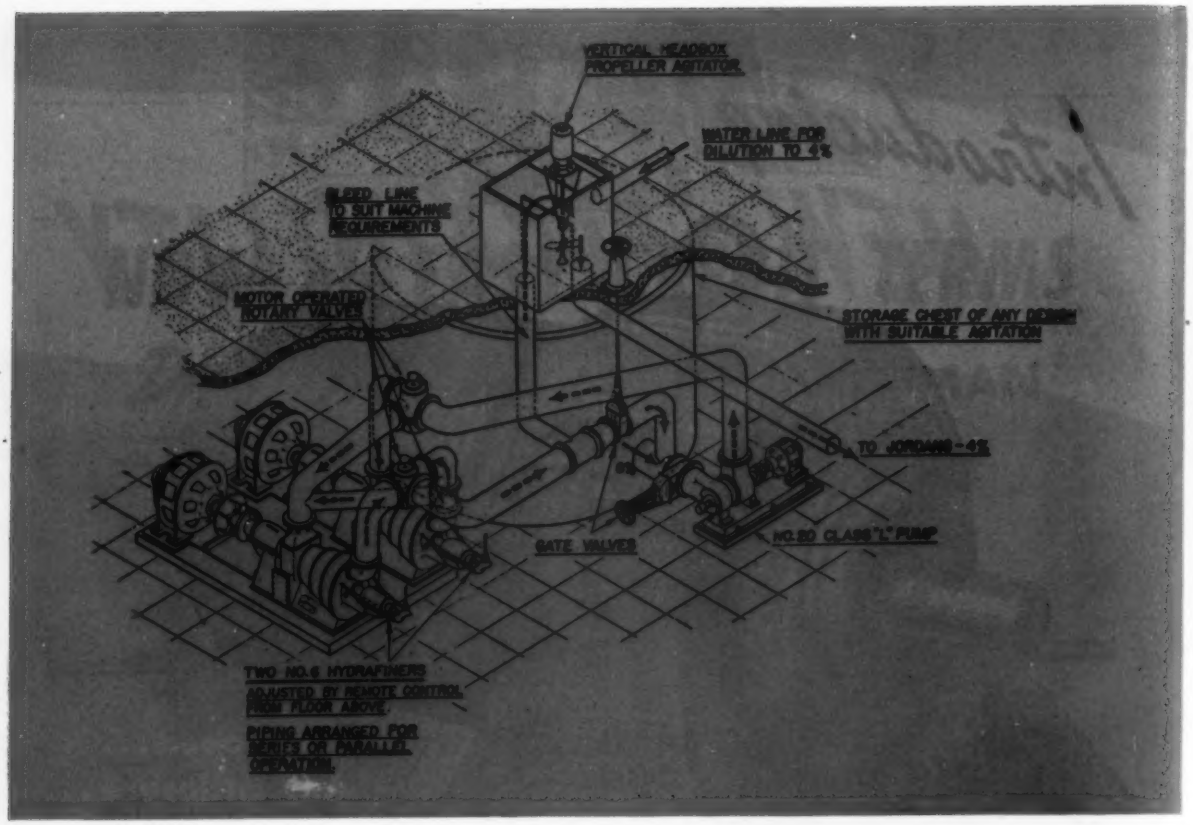
Any type enclosure of Reliance A-c. or D-c. Flange-mounted *Precision-Built* Motor may be chosen. A full selection of speeds from 4 to 1,430 rpm. is offered with motor ratings from 1 to 60 hp. For details of the many advances in design behind the superior performance of this sturdy, compactly constructed Reliance GearMotoR, write today for Bulletin C-404.

Built by RELIANCE ELECTRIC & ENGINEERING COMPANY and PHILADELPHIA GEAR WORKS, INCORPORATED

RELIANCE A-C D-C MOTORS

"Motor-Drive is More Than Power"


VERTICAL HEADBOX PROPELLER AGITATOR
WATER LINE FOR DILUTION TO 4%
BLEED LINE TO SUIT MACHINE REQUIREMENTS
MOTOR OPERATED ROTARY VALVES
STORAGE CHEST OF ANY DESIGN WITH SUITABLE AGITATION
TO JORDANS - 4%
GATE VALVES
NO. 8D CLASS "L" PUMP
TWO NO. 6 HYDRAFINERS ADJUSTED BY REMOTE CONTROL FROM FLOOR ABOVE.
PIPING ARRANGED FOR SERIES OR PARALLEL OPERATION.

HYDRAFINING

Like suggestive pictures? So do we. But here's something still better and it, too, is suggestive—suggestive of better paper, faster operation, happier operators—suggestive of dollars and dividends, something we all go in for in a great big way.

Locale: Southern kraft mill.

Product: Kraft bags, largely multiwall grade.

Problem: To produce more uniform sheet and a stronger sheet. To increase machine speed.

Refining: Five No. 5 Miami jordans ahead of the machine.

Change: Two No. 6 HYDRAFINERS installed. Stainless steel fillings in the jordans. Jordans, at times, reduced to just two in operation.

Result: Faster machine speed; hence, greater tonnage. More simplified control, giving more uniform and stronger sheet.

Future: Now operating at 4½% consistency. Expect to get up to 6% by making chest changes.

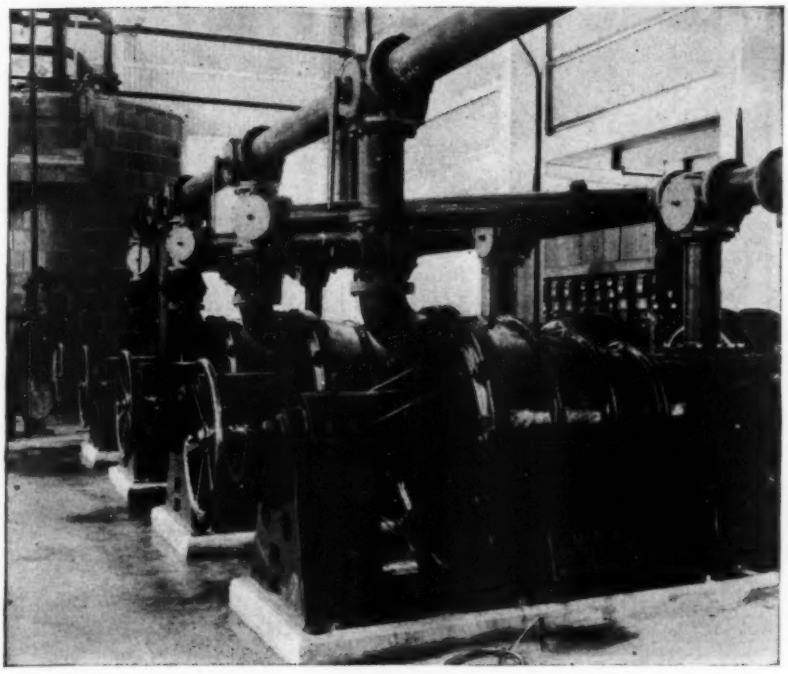
Future: Toying with idea of installing HYDRAFINERS back in pulp mill to help control freeness of the pulp, thereby reducing operating difficulties at the mill when running at high speeds.

That's our suggestive picture—a picture that confirms what we've been preaching with great regularity—that HYDRAFINERS have a definite but circumscribed job to do; that jordans have a definite but circumscribed job to do, and that real refining success lies in a proper balance of the two.

When thinking refining, when talking refining, when buying refining equipment, keep that central and all-important fact in mind.

HYDRAFINERS: No. 1, No. 4, No. 6

Shartle Bros. Machine Co., Middletown, Ohio
Dilts Machine Works, Fulton, New York
THE BLACK-CLAWSON COMPANY (ENGLAND) LIMITED, MOSSLEY, ENGLAND
Divs. of THE BLACK-CLAWSON COMPANY, HAMILTON, OHIO
Associate: Alexander Flack Limited, Ottawa, Ontario, Canada
Dilts



It's going to take a lot of fancy engineering to relegate the jordan to the scrap pile. The hoary-headed old beater may be slipping because of developments in the field of Hydrafining, but old Mr. Jordan still stands like the Rock of Gibraltar.

JORDANING

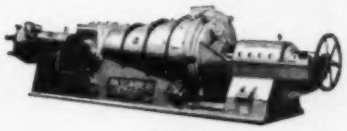
Just as there's nothing available to hydrate and brush the fibers equal to a HYDRAFINER, by the same token there's nothing like a jordan when it comes to cutting action.

Of course, the jordan must be of the right type, have the proper bar arrangement, be set up or backed off just so, operate at the right speed, to do the grand cutting job the stock requires. Given that, Mr. Jordan is still cock of the walk.

If you want to be keen and come up with the most effective refining layout which today's thought on the subject can suggest and today's engineering can provide, you'll strive for a proper balance between HYDRAFINERS and jordans—hydrafine, and then jordan.

It makes no dollar difference to us whether you install Hydrafiners or whether you install jordans. We build them both. But it does make a good-will difference to us—a heap of good-will difference—whether you put in what you ought to have. And on that platform we firmly stand.

No. 1



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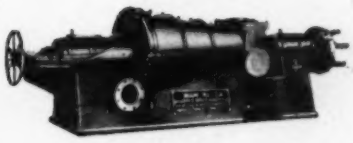

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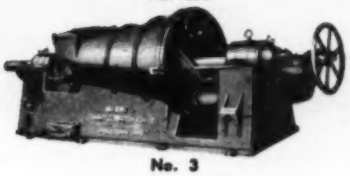

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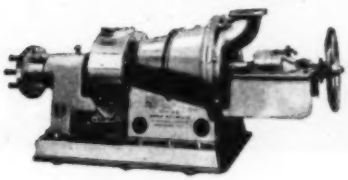

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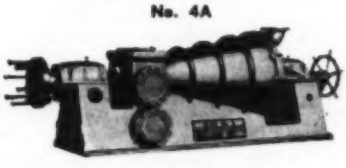
No. 4A



No. 5

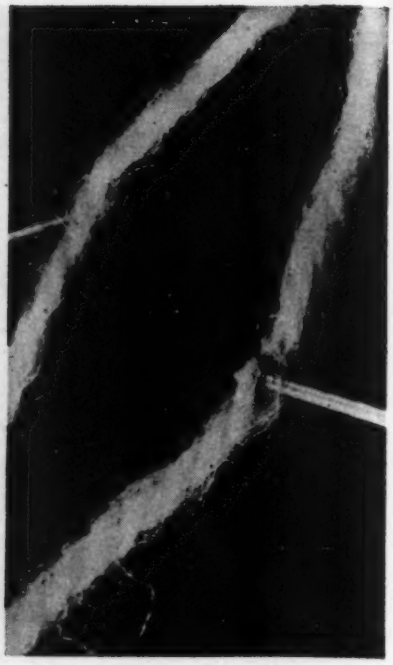
No. 6

Shartle Bros. Machine Co., Middletown, Ohio
Dilts Machine Works, Fulton, New York
THE BLACK-CLAWSON COMPANY (ENGLAND) LIMITED, MORDEN, ENGLAND
Divs. of THE BLACK-CLAWSON COMPANY, HAMILTON, OHIO
Associate: Alexander Flack Limited, Ottawa, Ontario, Canada

(A) Treated Wool Fiber

(B) Untreated Wool Fiber

(C) UNTREATED wool yarn tangles and fluffs, which leads to early matting and slower drainage.



(D) CHEMICALLY-TREATED wool yarn holds its shape and in a felt stays open and porous longer.

LESS MATTING — LESS WASH-UP

Like a pig's tail, a fiber of wool tends to curl. Treat it chemically and it becomes fairly straight. *(Photos A and B)*

Group many woolen fibers to form a strand and they'll curl, intertwine, and tend to mat when untreated—or stay fairly straight and remain open and more porous when treated. *(Photos C and D)*

Therein lies the difference between standard and chemically treated felts (Orr-Chems). That's why Orr-Chems—

(a) Go on easier; (b) Set to the machine more readily; (c) Permit machines to reach top speeds sooner; (d) Have high drainage characteristics; (e) Mat far more slowly; (f) Force the machine down for wash-ups far less frequently.

Mills interested in more satisfactory felts from the operation standpoint, in felts that cost less per ton of production, should line up with the many mills already using Orr-Chem felts.

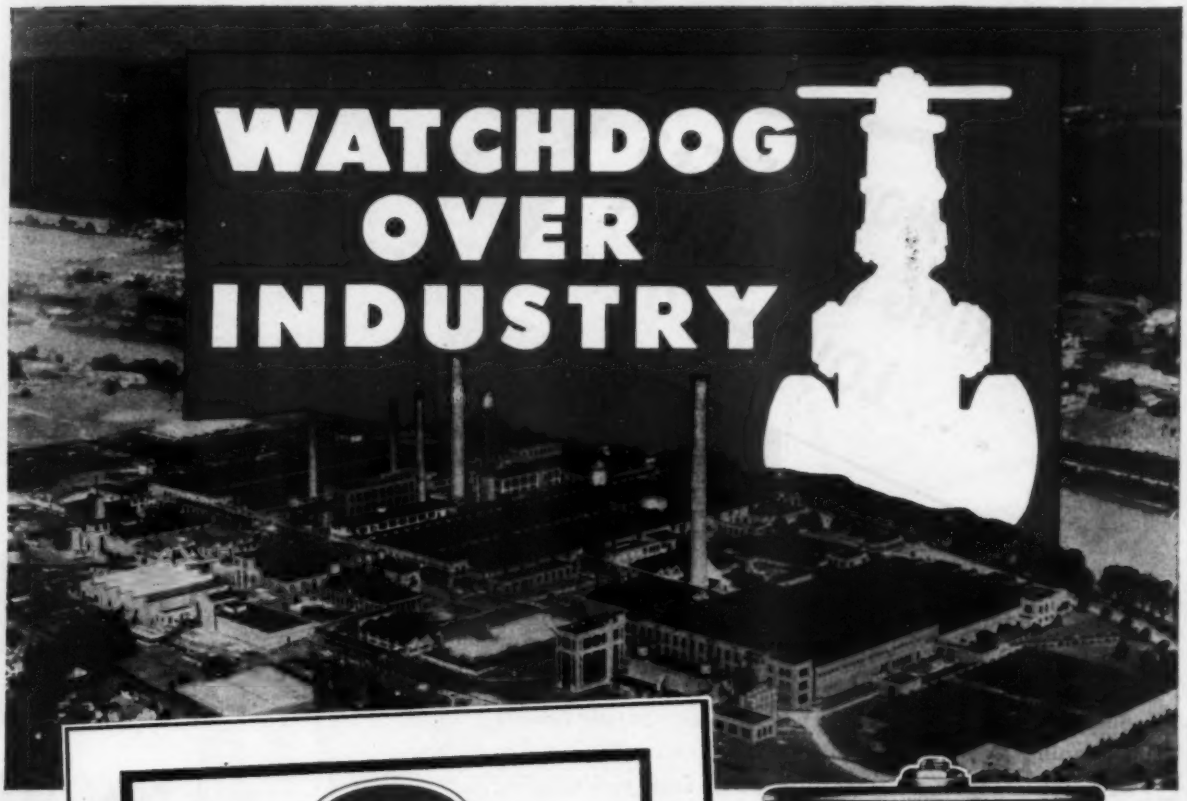
ORR FELT LINE, A COMPLETE LINE:

- STANDARD ORRS—untreated felts
- ORR-CHEM FELTS—chemically treated
- COTTON WARP for cement and asbestos products

THE ORR FELT & BLANKET CO., PIQUA, OHIO

ORR

WATCHDOG OVER INDUSTRY

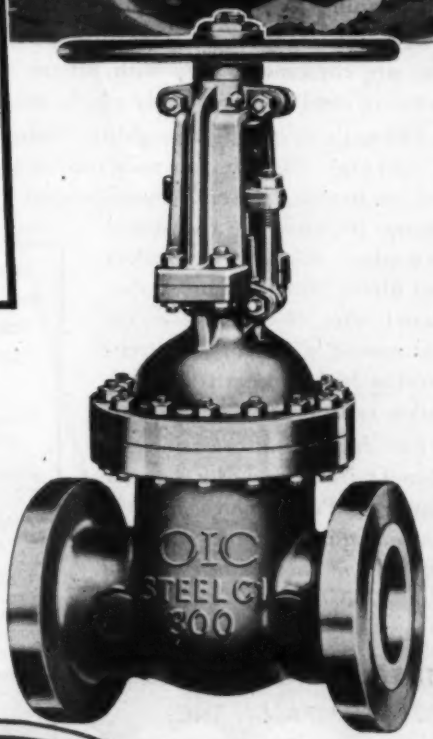


OIC

PACE-SETTER IN VALVES

Everywhere OIC Valves are the trusted guards of industry's vast resources! By day and by night they constantly watch over millions of dollars in industrial materials. Leak-proof joints guard against disastrous pressure-drop. Streamlined designs protect flow from turbulence. Heavier construction throughout keeps pressures and stresses within safe bounds. Wedges of heavy I-beam design keep a close watch on the fluid passageway, stopping all flow with positive, leak-proof closure, or opening the streamlined ports for smooth, even, *free* flow! Integral body ribs guide the wedge to its seats with unerring accuracy—effectively reduce vibration and wear.

Your pipelines are *safer* when they're protected by OIC, Pace-Setter in Valves!



VALVE INFORMATION THAT YOU NEED IS ALWAYS AT YOUR FINGERTIPS IN THE BIG 248-PAGE CATALOG! . . . Send for your free copy today. You'll save time with the valve data and specifications that you can use so quickly and easily. Simply write The Ohio Injector Company, Wadsworth, Ohio.

OIC VALVES

8-418-8

STEEL • IRON • BRONZE

WHY MONEL FACES BRING LONGER LIFE . . . LOWER COSTS

Many factors govern the life and performance of wire cloth faces and winding wire.

One of them is the wire itself.

Well known and proved is the corrosion resistance of Monel to pulps, paper mill stocks and white waters, caustic liquors and cleaning solutions of dilute muriatic and sulfuric acids.

Of equal importance is that Monel wire faces and winding wire are combined *safely* with bronze cylinder parts under corrosive conditions generally met in stock preparation.

Add to those qualities a rigidity almost twice that of bronze . . . add high strength, and resistance to abrasion and wear . . . and you have the reasons why mills report up to 10 years of continuous performance for Monel on washers, thickeners, cylinders and filters. And remember that Monel wire cloth is *lowest* in cost among wire cloths of comparable high strength and corrosion resistance.

For further information on Monel wire cloth, write for your copies of *Performance and the Reasons* and Bulletin C-3, *Monel, Nickel and Inconel in Pulp and Paper Mills.*

THE INTERNATIONAL NICKEL COMPANY, INC.

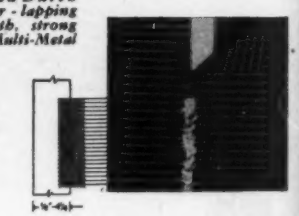
67 Wall Street, New York 5, N. Y.

EMBLEM OF SERVICE

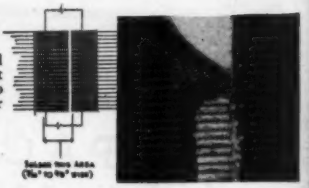
INCO

Monel

Seams for Monel faces are readily made by silver soldering or welding. This improved butt joint for corduroy and twilled Dutch weaves eliminates over-lapping and produces a smooth, strong seam. Developed by Multi-Metal Wire Cloth Co.



1 ¾" x .014" Monel strip spotwelded to under side of one end. ½" to project.



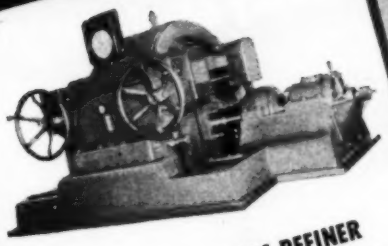
2 Bring cover around to close fitting butt joint. Solder cloth to Monel strip and over butt joint.

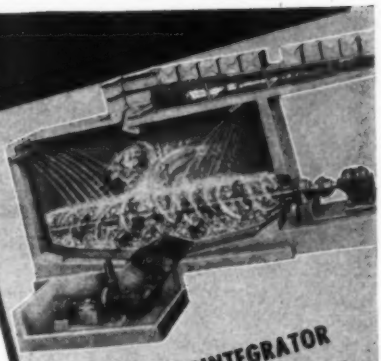
ESTABLISHED TYPES OF MONEL WIRE CLOTHS for PULP and PAPER MILL SERVICES		
Pulp Thickeners	*Monel Backing Screens*	*Monel Top Screens*
VACUUM FILTERS	10, 12, 14 mesh*	40, 50, 60 mesh
SAVE-ALLS	10, 12, 14 mesh*	50, 60, 70, 80 mesh (12 x 64 corduroy cloth used without backing screen)
Unbleached Stock Washers		
VACUUM FILTERS	10, 12, 14 mesh*	30, 40, 50, 60 mesh
DECKERS AND CYLINDERS	12 x 64 mesh Monel and 14 x 88 mesh Monel corduroy cloth used without backing screen	
Alkaline Bleached Stock Washers *		
VACUUM FILTERS	10, 14 mesh*	40, 50 mesh
BOARD MACHINE CYLINDERS	10, 12, 14 mesh	30, 40, 50, 60 mesh
BEATER WASHER		40, 50, 60 mesh
Lime Sludge Filters VACUUM TYPE	14 x 100 mesh Monel, 24 x 110 mesh Monel, 200 twilled Dutch weave Monel and "AU-Type" extra heavy braided weave Monel for filter cloth	
Water Filters CYLINDER AND VACUUM TYPE	12 x 64 mesh Monel, 14 x 88 mesh Monel 80 mesh twilled Monel (wire dia. 0.007") 100 mesh twilled Monel (wire dia. 0.005") 120 mesh twilled Monel (wire dia. 0.004") 120 x 140 mesh twilled Monel (wire dia. 0.004")	
CLAY AND COLOR STRAINERS	150, 200 and 325 mesh Monel	

*10 mesh recommended for increased open area and drainage—**For chlorinated, acid-bleached stock washers Type 316 nickel-chromium-molybdenum alloy steel recommended.

This classification table is offered for your guidance through the courtesy of the Multi-Metal Wire Cloth Company, N. Y. *Write us for copies.*

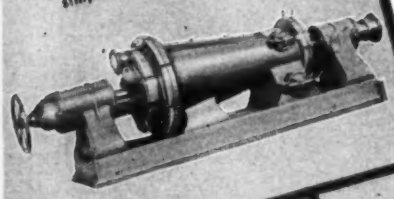
for STOCK PREPARATION





JONES JORDANS

Ruggedly and accurately made, insuring continued fine performance with ease of control and simple maintenance.

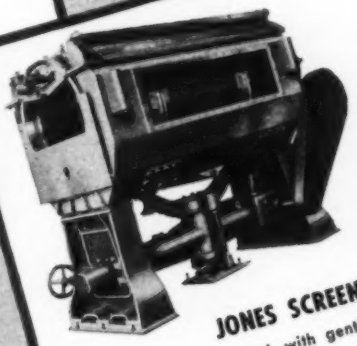


JONES DOUBLE-DISC REFINER

A high capacity machine with greater output per unit.

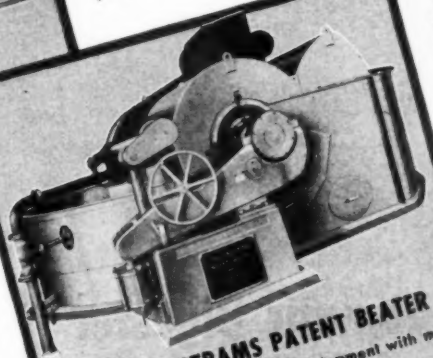
LIEBECK DISINTEGRATOR

A versatile machine for pulping broke and pulp. Can be fitted into unusual mill locations.



JONES HIGH-SPEED REFINER

Several hundred installations have proved the efficiency and flexibility of this famous machine.

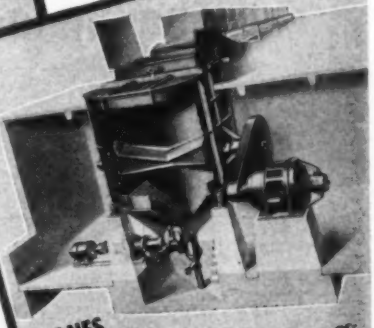


JONES-BERTRAMS PATENT BEATER

The best for maximum fibre development with minimum power consumption.

JONES SCREEN

Efficient cleaning of stock with gentle action and ease of operation.

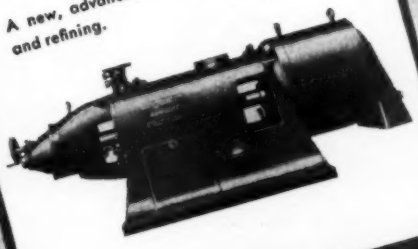


JONES PULPMASTER

The advanced pulper with two-stage action combining refining with pulping.

JONES COMPOSITE

A new, advanced design unit for beating and refining.



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"Packaged" units—simplified and efficient—with ease of installation and low maintenance.

Descriptive Bulletins, detailed information, and quotations furnished for the asking.

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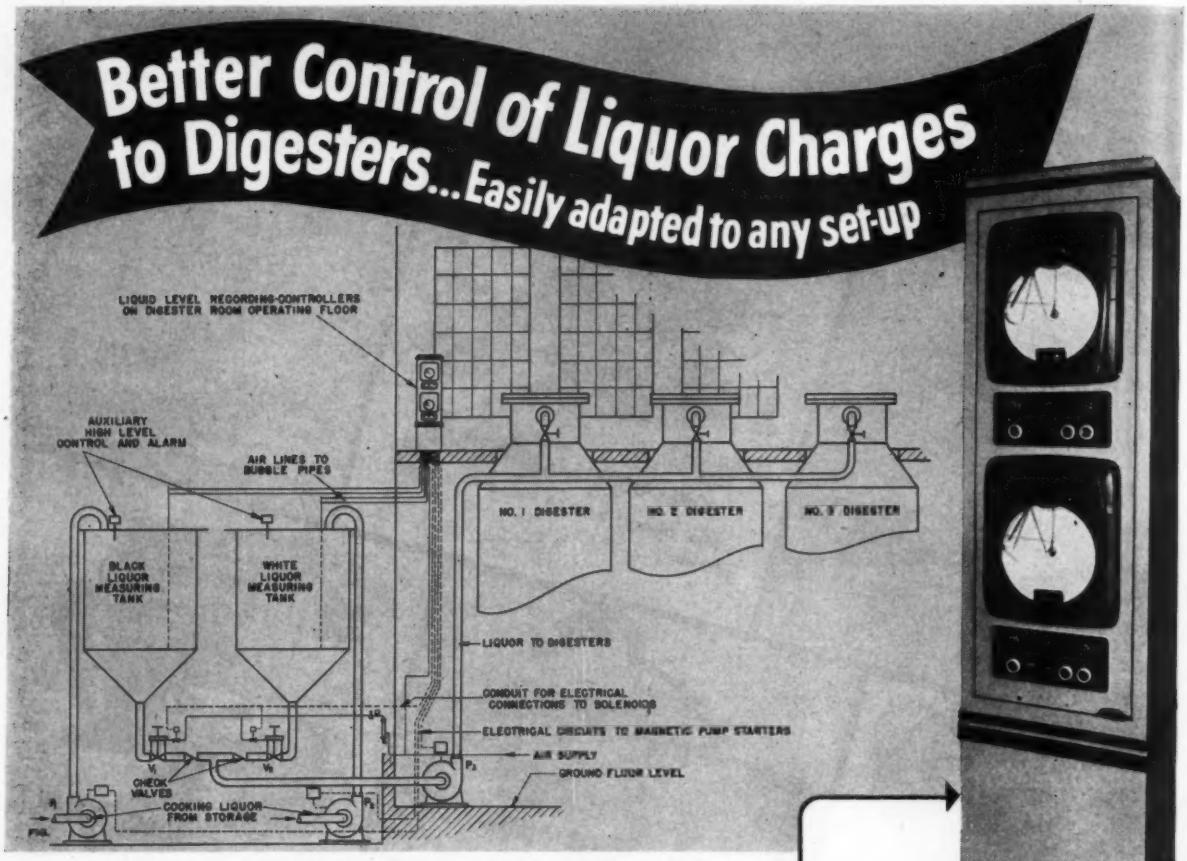
E. D. JONES & SONS COMPANY-PITTSFIELD, MASS.
Builders of Quality Machinery for Paper Mills

MANUFACTURERS AND DISTRIBUTORS IN CANADA: WATEROUS LTD., BRANTFORD, ONT.

Better Control of Liquor Charges to Digesters... Easily adapted to any set-up


LIQUID LEVEL RECORDING-CONTROLLERS ON DIGESTER ROOM OPERATING FLOOR
AUXILIARY HIGH LEVEL CONTROL AND ALARM
AIR LINES TO BUBBLE PIPES
NO. 1 DIGESTER
NO. 2 DIGESTER
NO. 3 DIGESTER
BLACK LIQUOR MEASURING TANK
WHITE LIQUOR MEASURING TANK
LIQUOR TO DIGESTERS
CONDUIT FOR ELECTRICAL CONNECTIONS TO SOLENOIDS
ELECTRICAL CIRCUITS TO MAGNETIC PUMP STARTERS
AIR SUPPLY
GROUND FLOOR LEVEL
CHECK VALVES
COOKING LIQUOR FROM STORAGE

The FOXBORO Automatic Digester Liquor Measuring System

Accurate, uniform charges of liquor to digesters can be depended upon, day in and day out, year after year, when this modern packaged control system is installed. The chart gives a permanent record of the amount of liquor used; improvements in product quality and uniformity show up almost immediately.

This control system is equally adaptable to set-ups having measuring tanks on the digester operating floor, on the ground floor, outside the digester building, or any other mill layout.

Your operators, too, will appreciate how easy it is to run this system. Merely setting a control index and pushing a button is all that's needed in normal operation. The Foxboro Automatic Digester Liquor Measuring System does all the rest — charges the digester and refills the measuring tanks.

By combining the simplicity of the widely used air bubble principle of liquid level measurement with the efficiency of Foxboro's Rotax Electrical Controller, you are assured of continuous trouble-free operation. Foxboro liquor measuring systems have been in continuous operation without maintenance for as long as 9 years.

Cabinet Equipment

- 2 Rotax Liquid Level Controllers for White and Black Liquor
- Simple, Push-Button Stations
- Red and Green Signal Lights
- Manual Valve and Pump Control for Emergency Use

Foxboro Automatic Digester Liquor Measuring Systems come completely assembled in attractive, rugged, dust-proof steel cabinets. Piping and wiring is pre-engineered at the factory. Only the simplest of connections are needed to start operation.

Are **you** profiting by these advantages? Write for complete details. **The Foxboro Company, 158 Neponset Avenue, Foxboro, Mass., U.S.A.**

FOXBORO Reg. U.S. Pat. Off. **AUTOMATIC DIGESTER CONTROL**

Mills that Use SIMONDS

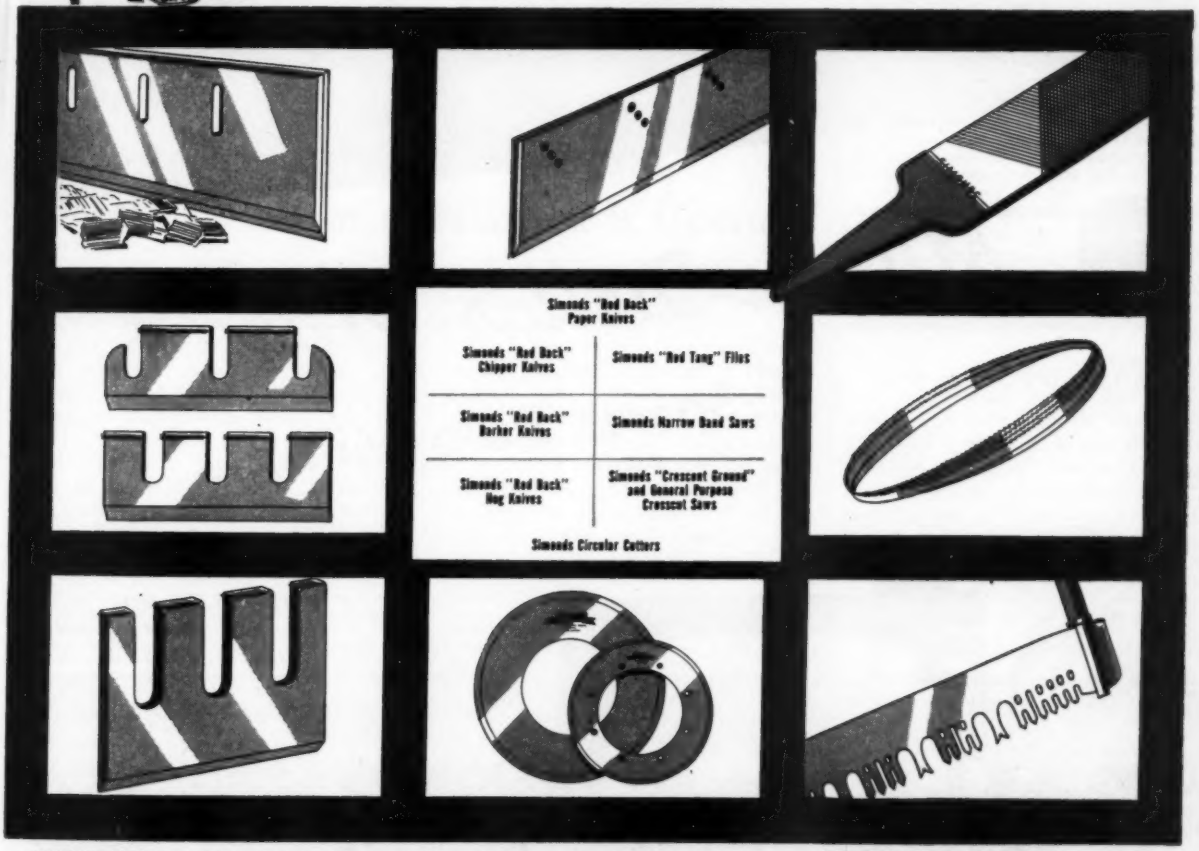
Stay in the Highlands of CONSISTENT CUTTING EFFICIENCY

Simonds runs one of the world's top tool steel mills — to get special steels that are consistently good enough for Simonds Cutting Tools.

Simonds originates special methods and equipment to harden, temper, grind and finish these tools so that they will deliver an honest day's work, day after day.

And overseeing every operation are seasoned Simonds men . . . many with 20, 30, and 40 years of daily living with this hard-and-fast rule: "Simonds makes *first quality only.*" And by way of keeping a running check on that quality, *they use Simonds Tools to make Simonds Tools!*

So rest assured that your cutting-tool dollar is *invested* — not spent — when you order Simonds from your dealer.


Simonds "Red Back" Paper Knives
Simonds "Red Back" Chipper Knives
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Simonds "Red Back" Barker Knives
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BRANCH OFFICES: 1350 Columbia Road, Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 416 W. Eighth St., Los Angeles 14, Calif.; 228 First St., San Francisco 5, Calif.; 311 S. W. First Avenue, Portland 4, Ore.; 31 W. Trent Ave., Spokane 8, Wash. *Canadian Factory:* 595 St. Remi St., Montreal 30, Que.

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Cutting Tools
For the Pulp & Paper Industry

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Million-Dollar Fire

Spares Pulp Mills . . .

Fire which started from an electrical control box under the dock destroyed the Weyerhaeuser Cargo Dock, Longview, Washington, on August 3. Swift fire-fighting action confined the fire to the 1800-ft. long dock. The company's Pulp Division (at left of smoke in the burning picture above) was endangered, but not damaged. The devastation as seen the morning after the fire is shown in the illustration at left.

—Rankin photos

Side view of new Johns-Manville Insulating board plant at Natchez, Miss. The plant consists of three major buildings joined together and 24 minor buildings, on a site of 250 acres. The major buildings are of saw-tooth design, giving a maximum of light and ventilation

Johns-Manville Insulating Board Plant at Natchez Is Opened

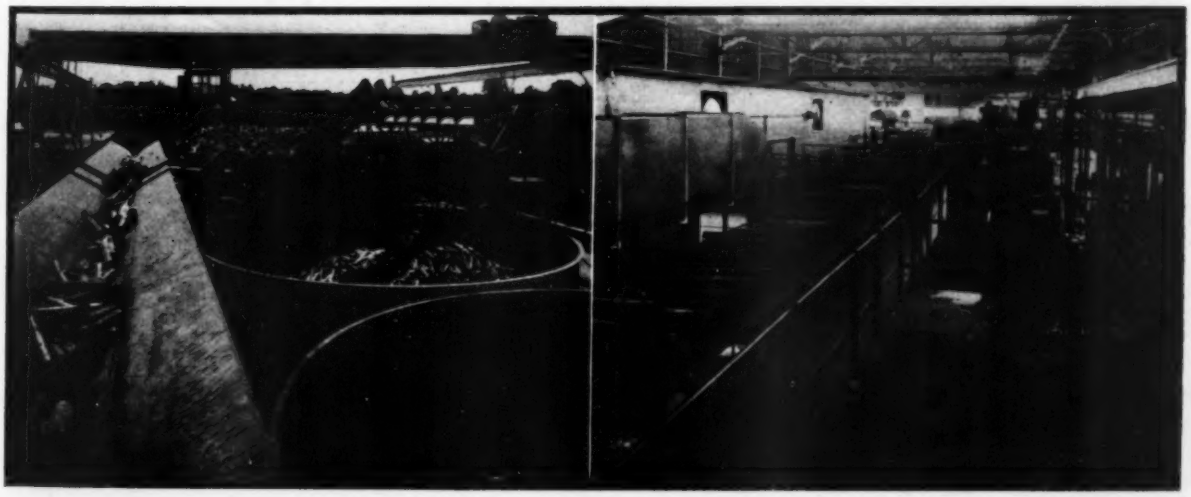
▸▸▸ A DISTINGUISHED GROUP of Mississippi public officials, business leaders, editors, and writers attended the unveiling of the new insulating board plant of Johns-Manville Corporation at Natchez, Mississippi, on June 25.

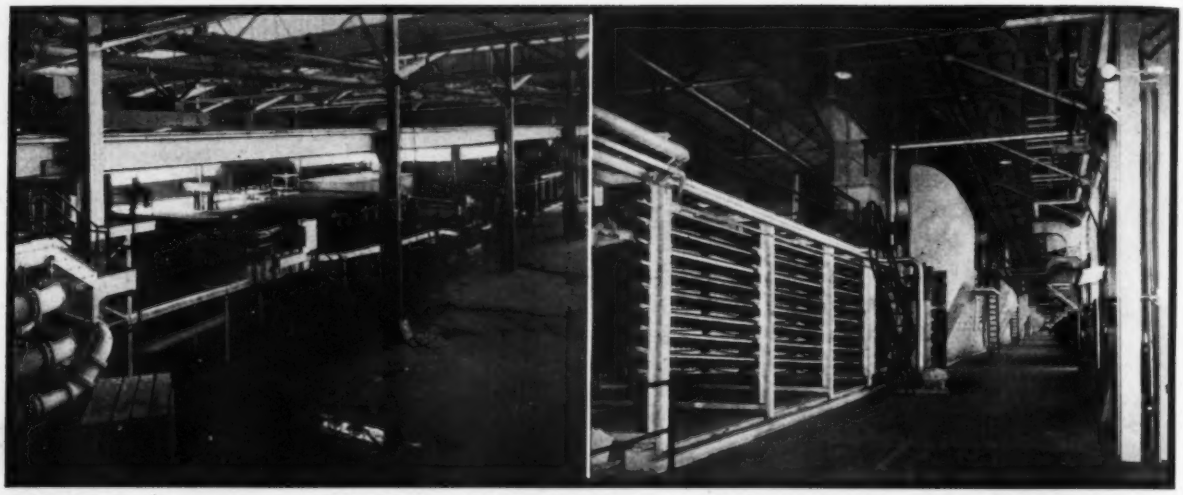
D. R. Seip, plant manager, welcomed the group on behalf of Johns-Manville and commended the co-operation of the people and officials of Mississippi who had made it possible for the corporation to locate this new plant at Natchez. He then introduced Howard W. Allen, director of public relations from Johns-Manville headquarters in New York.

Operations were in progress as this first group of visitors toured the new buildings. Located just southeast of Natchez, the plant consists of three major buildings joined together and twenty-four minor buildings. The whole plant operation covers an area of 400,000 square feet on a 250-acre site, allowing for possible future plant expansion.

When in full operation, the plant will employ from 400 to 600 people with an estimated annual payroll of $750,000. It is expected that the eventual output of insulating board products will be approximately 200,000 square feet. Among the insulating board products which will be manu-

LEFT—Overhead crane and interior of soaking tanks at new J-M Insulating Board Plant in Natchez. The traveling crane picks logs off conveyor and dumps them into the soaking tanks, and then removes the logs from the tanks and onto another conveyor which takes them to the grinders. . . . RIGHT—Here softwood is shown on its way to the grinder. The softwood pulp is prepared by four modern grinders, powered by 3,000 hp. motors. Hardwood pulp is prepared by a chipper and cooked in digesters. To obtain quality, a system of blending various grades of pulp has been incorporated





LEFT—Interior view of J-M Natchez plant shows forming machine, press and dryer. RIGHT—View of the enormous dryer at the Natchez plant. This dryer is said to be the largest ever built. It has 18,000 bearings and requires about 1,000 hp. in electric motors to operate. It is fired by natural gas, with automatic controls, and is equipped with the latest type of fire protective devices

factured at Natchez are natural finish building board, decorative ceiling panels, wall plank and insulating board sheathing.

Plant Designed To Meet Industrial Trends

The plant is mechanized to an unusual extent in keeping with the future industrial trends. The unloading and handling of pulpwood is all done by mechanical means and the fabricating and coating equipment for various types of insulating board is of special design developed by Johns-Manville. The dryer, through which the insulating board passes, is said to be the largest ever built. It has 18,000 bearings and requires about 1,000 horsepower in electric motors to operate.

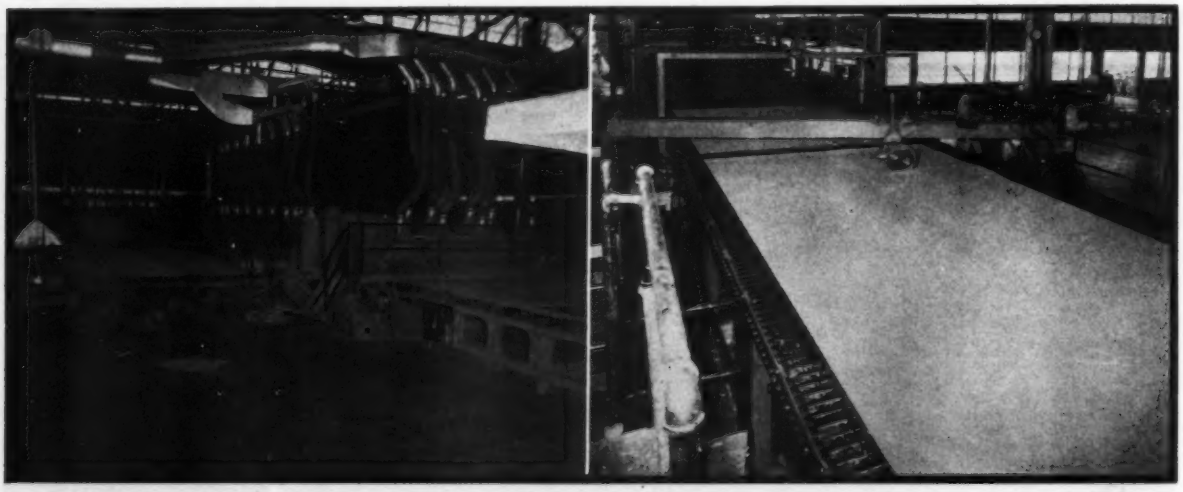
To operate the plant, a four and one-half mile natural gas supply line was built and a five-mile waste disposal line constructed to avoid local stream pollution. Four 500-foot deep wells were drilled to supply water for the plant.

The raw material to be used consists largely of pulpwood processed on the spot from short leaf pine and hardwoods. Purchase of timber by Johns-Manville will provide a continuing and permanent cash crop for farmers and timber owners in the southwest Mississippi area.

A new manufacturing process at the plant permits the utilization of a larger proportion of hardwoods as well as short leaf pine. The economic significance of this innovation to farmers and timber growers is considerable when it is understood that about 30 per cent of the wood in the Natchez area is of hardwood species.

Johns-Manvile will encourage and practice the most modern forestry methods not only on its own lands, but on the property of those farmers and timber growers from whom it buys pulpwood. By its three-phase program of forest practices, forest education, and fire protection which the company has followed for ten years at its Jarratt, Virginia, insulating board operations, the forests of Mississippi will continue to produce valuable timber crops for generations to come, and a priceless natural resource will be preserved for the state and nation.

After the plant inspection Johns-Manville was host to the visitors at a luncheon in the Old Carriage House of Stanton Hall, and later an informal tour of Natchez was conducted.



LEFT—Finishing department in the J-M plant. In this operation, the board comes from the dryer and is cut and trimmed to required sizes. The octopus-like tubes collect and remove the dust rising from the cutting and trimming. . . . RIGHT—Automatic, electrically-operated traveling saws cut continuous sheet of insulating board in 14 ft., 6-in. lengths at the J-M plant

PAPER · · · America's 6th Industry

CENTENNIAL SPOTLIGHT 1848-1948
In this 100th anniversary year as Machine Builders for the Paper Industry, Puseyjones points with pride to outstanding post-war installations. In the spotlight . . . 216" Fourdrinier Liner Board Machine for Southern Paperboard Corporation, Port Wentworth, Ga.

DDT TREATED PAPER FOR NURSERY WALLS

(NEWS ITEM: *Anti-insect wallpaper for children's rooms contains 5% active DDT in the coating and colors.*)

DDT treated wallpaper! Just moisten and hang! This exciting new development is being featured in children's rooms. Designed to provide protection against disease-carrying insects, this new wallpaper kills flies, mosquitoes, ants, moths and other insects that come in contact with its patterned surface. Insect-killing properties are guaranteed effective for one year. Will not rub or wash off. Tests show it to be odorless and completely harmless to humans and pets. Manufacturer's name on request.

Paper drapes . . . paper shipping bags . . . steam pressing paper . . . new uses for paper calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities — new opportunities for the Pulp and Paper Industry.

The Puseyjones Organization is now devoting itself completely to the design and construction of Paper-Making Machinery built to new high standards of speed and efficiency, and to the modernization of existing machines. Additional capacity in Metals Fabrication is now available through conversion of facilities formerly devoted to the building of ships.

Puseyjones Engineers will welcome the opportunity to work with you in solving production problems.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U. S. A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

D. R. Seip, manager of new J-M Insulating Board Plant at Natchez

Donald Seip Is Plant Manager

Donald R. Seip was appointed to the position of plant manager of the insulating board plant at Natchez in August, 1946. Prior to that time he had been general superintendent of paper mill, roofing and pipe covering in the company's large plant at Manville, New Jersey.

He began his association with Johns-Manville in 1937 as an engineer at the old Johns-Manville insulating board plant at Oswego, New York, an operation which was discontinued in 1938 with the opening of the Jarratt, Virginia, plant. He helped plan the Jarratt plant and was made plant manager there in 1942.

J-M Company Was Founded in 1858

The history of the Johns-Manville Corporation starts in 1858 when H. W. Johns, roofing manufacturer and father of the asbestos industry, started as a jobber and manufacturer in a small basement shop in New York. In 1868 he first made known the results of long and continued research and experiments with asbestos fibers.

In 1901 the firm merged with the Manville Covering Company of Milwaukee, acquiring the name Johns-Manville, Incorporated, in 1920. Today it employs about 18,500 persons, operates 20 plant and mine locations, and about 80 sales offices in the United States and Canada. In 1945 the company began a $60,500,000 company-wide expansion and improvement program of which the new Natchez plant was a major undertaking.

Forest Service Accepts Bid for Alaskan Pulp Timber

▶▶▶ ACCEPTANCE BY the Forest Service, U. S. Department of Agriculture, of a bid for 1,500,000,000 cubic feet of timber in the Ketchikan pulp timber unit of the Tongass National Forest in Southeast Alaska by the Ketchikan Pulp & Paper Company, an affiliate of the Puget Sound Pulp & Timber Company, of Bellingham, Washington, was announced August 2 by C. M. Granger, Acting Chief Forester.

The bid contemplates the establishment of a large, modern pulp mill, involving the expenditure of from 20 to 30 million dollars, with an ultimate capacity of around 500 tons of pulp per day, at Ward's Cove six miles north of the city of Ketchikan. The company already has acquired a mill site on the cove. The Ketchikan pulp timber unit is the first of five or six such units in the Tongass Forest, including in all 8,000,000,000 cubic feet of timber, development of which is planned by the Forest Service.

The Ketchikan pulp timber sale is the fruition of 30 years of effort on the part of the Forest Service to bring the pulp and paper industry to Alaska. A comparable sale and development was on the point of completion when it was blocked by the depression of the early thirties. Providing a stable major industry with year-round operation and employment, the Ketchikan development marks the first step in the opening up of the territory's huge pulp timber resource, the largest untapped resource of the kind on the continent. It is expected to play an important role in expanding the economy of the territory on a sound and secure basis.

Sale of the Ketchikan pulp timber was originally advertised in September, 1947, with bidding scheduled for the following December. Subsequently, the bidding date was postponed until April 14, 1948, but no bids were received. With terms substantially the same as those originally proposed, the timber was re-advertised by the Forest Service June 18, this year, and parties wishing to submit offers were required to qualify by July 19.

At that time, the Ketchikan company was the only qualifier, satisfying the Forest Service as to its ability to finance surveys, designs, and plans essential to mill construction and operation; business standing and experience in the manufacture and distribution of pulp and paper products and the building and operation of large industrial projects; and knowledge of the timber, water power and operating conditions in Southeast Alaska.

The bid was made on the basis of a 50-year cutting contract expiring June 30, 2002 A.D., and the company agreed to pay 85 cents per 100 cubic feet for timber cut for manufacture of pulp prior and up to July 1, 1962. For trees intended for manufacture or sale in other forms than pulp or pulp products, such as veneer logs or sawlogs cut in the same period, it agreed to pay $3 per thousand board feet for spruce sawlogs, $1.50 per thousand for cedar, and $2 per thousand for sawlogs of hemlock and other species. After July 1, 1962 and at subsequent five-year intervals, these rates, as provided by the contract, will be reappraised by the Forest Service.

Under the terms of the bid contract, the Ketchikan Company on August 2 tendered the Acting Chief Forester a certified check for $25,000 payable to the Treasurer of the United States, and within seven days must pay $75,000 more as an additional guarantee of qualification for final award and execution of the sales agreement within specified time limits.

Within one year, the company must show adequate financial resources for the construction of the mill, and must qualify for a water power license from the Federal Power Commission. While the contract calls for a plant capable of producing 150 tons of pulp per day within three years, and 300 tons per day within five years, and provides sufficient timber for an ultimate production of 525 tons per day, it is understood that because of the pulp and paper shortage the company is considering the construction of a mill of around 500 tons per day capacity at the start of its operations. It is expected that the company will employ about 1,200 workers.

The bulk of the timber covered in the bid is on Prince of Wales Island north of Hydaburg, Craig, and Klawock. It is 75 per cent hemlock and the balance mainly Sitka spruce with some small amounts of Alaska and western cedar. The operable stand per acre is between 20,000 and 25,000 board feet or 3,600 and 4,500 cubic feet.

Outstanding considerations in resource protection stipulated in the contract are the handling of the timber on a sustained-yield basis, the safeguarding of salmon spawning streams which are the basis of the Alaska salmon industry, the preservation of

LOOK at the nice heavy white overcoat on the couch rolls of these Save-Alls. That's good, high priced paper stock — and the Bird Save-Alls are sending it back to the machine chests for making into good, salable paper!

Bird Save-Alls get the stock out of waste water in the simplest, lowest cost way. Under present conditions they pay for themselves quicker than ever.

If you're still letting any of your precious papermaking fibres go down the drain, better see what you can do with the right Bird Save-All hook-up.

BIRD MACHINE COMPANY • South Walpole, Mass.

unusually fine scenic areas, and the prevention of stream pollution.

The principal officers of the Ketchikan Company are all connected with the Puget Sound Pulp & Timber Company. They are: Fred H. Stevenot, of San Francisco, chairman of the board; Lawson P. Turcote, of Bellingham (Wash.), president; and Robert H. Evans, of Seattle, vice president.

▼

BECKETT PAPER COMPANY PUBLISHES ADVERTISING BOOK FOR CENTENNIAL

As a tangible expression of esteem and gratitude to users of printing papers, particularly those in the advertising field, The Beckett Paper Company, Hamilton, Ohio, on the occasion of its centennial year, is offering a textbook just published entitled *Advertising and Its Mechanical Production.* The material contained in the volume is a revision and elaboration of a book under the same title written and published in the year 1931 by the late Carl Richard Greer, then advertising manager of the Beckett Paper Company.

The book has been given a deluxe format. The page size is 10 x 13 inches, and it is bound in heavy Buckeye cover stock. It is printed by offset lithography in four colors on 32 pound Brilliant White Beckett Opaque stock —vellum finish. An attractive dust jacket is printed in four colors by letterpress. There are 256 inside pages.

The content of the book covers a wide field, and leading experts in various fields of advertising and printing have made important and generous contributions to the preparation of the material. Chapter headings are as follows: The Background of Advertising, The Advertising Agency, Research, General Advertising, Radio Advertising, Outdoor Advertising, Direct Advertising, Forms of Direct Advertising, Planning Printed Matter, The Prospect List, House Organs, Advertising Layouts, Advertising Typography, Advertising Art, Engravings for the Advertiser, Halftones and Line Etchings, Letterpress Printing, Gravure Printing, Offset Lithography, Color in Advertising, Printing Inks, Selection of Paper, and Appendix. The book is profusely illustrated, mostly with reproductions of outstanding pieces of printing and prize-winning advertisements.

Complimentary copies are being sent to printers, advertisers, and advertising agencies throughout the U. S. A. on lists supplied by the wholesale merchants of The Beckett Paper Company. Approximately five hundred copies are being sent to public libraries and to libraries of colleges and universities. To all others, not on one of the complimentary lists, the book is offered at a price of $10.00 per copy, postage charges prepaid.

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BRITISH PAPER NOTES (May, 1948)

At long last the British Paper Trade can report a slight upward trend in paper production and in consumption for the Home trade. But even these improvements do not bring the Trade back to where it was two years ago.

Of these improvements the most spectacular is that of newsprint which has moved up from the present 24 per cent of prewar to 35 per cent, a percentage which, incidentally operated early in 1946. However, this higher permitted production represents some 30,000 tons extra newsprint in the license period of four months which will form a very useful addition to the present extremely low stocks. Increased production is also being allowed for mechanical printing papers, wallpapers, M.G. envelope and sulphite papers together with the pure and imitation krafts. Naturally these additions have allowed for increased quotes not only to the paper merchants, but also for many of the more important paper usages. What is perhaps of greater interest is the discontinuance of the return which had to be made to the Paper Control during recent license periods of the total of all small orders supplied to printers and other paper consumers showing how much paper was used for direct and indirect export and home consumption. This will save a lot of unnecessary paper work and statistical gathering.

Concurrently news from European paper producing countries show that while in Norway restrictions are hampering trade, other countries are also experiencing a slowing-down of trade. Meanwhile, the Swedish Paper Mills Association has reached its half century and the occasion has been celebrated by a meeting and a banquet in the Town Hall, Stockholm. Representatives of the paper trades of Great Britain, Finland, Norway and Denmark were present and the guest of honor was H.R.H. the Crown Prince of Sweden. From a 600 page volume issued in connection with this occasion it is disclosed that production of paper and board in Sweden has risen from 86,000 tons in 1898 to 1,300,000 tons in 1947 and the number of mills at present in operation is 71, twelve more than at the end of the last century. Exports in the fifty years have advanced from 43,000 to 549,000 tons although these exports are 93,000 tons below the peak year, 1947. Home consumption has advanced ten times in the last fifty years, from 53,000 tons to 530,000 tons but consumption at present is appreciably reduced to allow for greater export.

In France, however, contrary to some other European countries, production has steadily advanced until that country at least is practically back to prewar for figures recently published show that production in February of this year reached 91,178 tons and the rate of production in the previous month was at 98 per cent of 1948.

To return to England a Parliamentary official report discloses that present consumption by the various government departments in 1947 was at the rate of 212 per cent of prewar. The actual average for the years 1931 to 1938 being 24,640 tons and the total for 1947 51,180 tons.

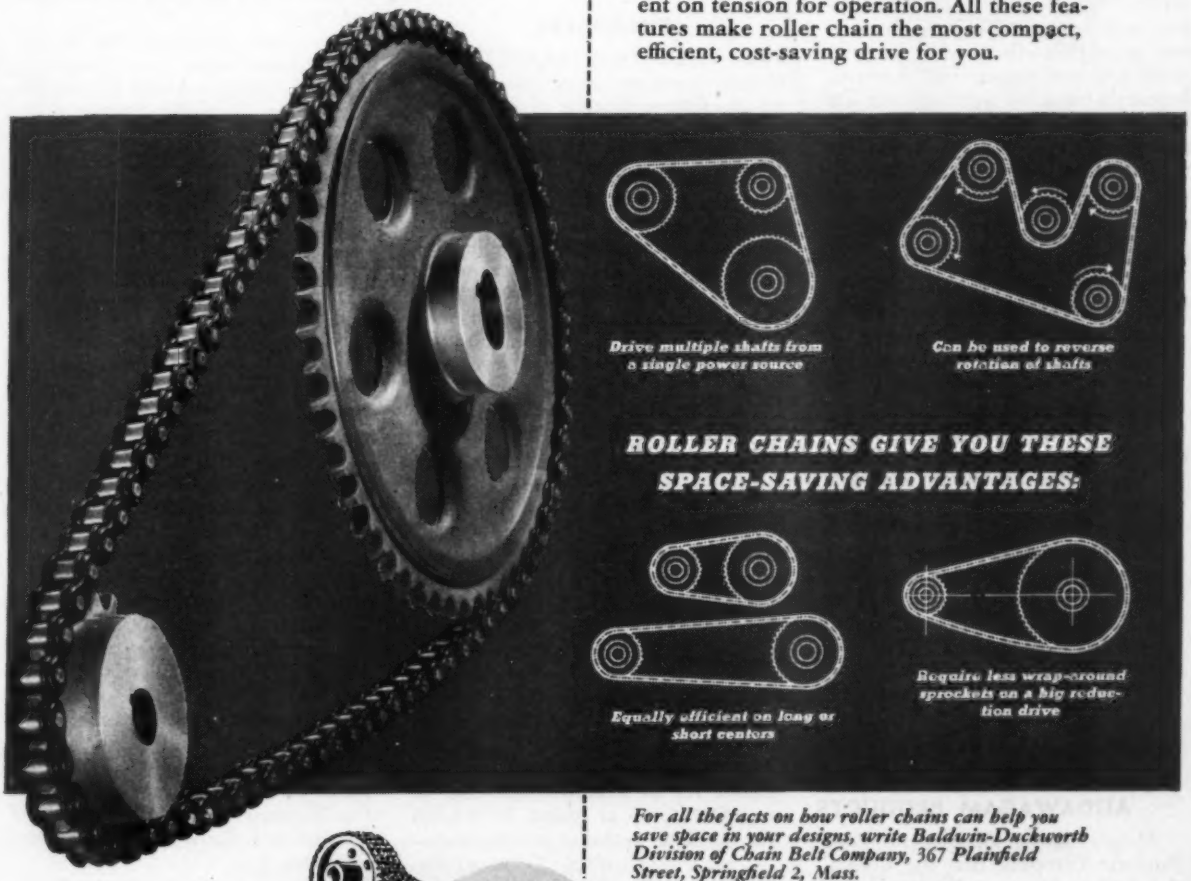
The Bowater concerns are making paper trade history for they have recently secured a contract to produce

You can save space... add flexibility... with roller chain

With the present trend toward compactness in design, the outstanding advantages of roller chain become more important than ever to the machine designer. With roller chains, you can:

Save Space. Regardless of load conditions or speeds, roller chains require less width to effectively transmit power. Since they are not dependent on tension for effective operation, sprocket size can be held to the minimum, particularly on drives where there is a considerable reduction in speed ratios.

Add Flexibility. Since roller chains can be flexed in either direction, they can be used to reverse direction of shaft rotation. They can drive multiple shafts from a single power source. Shafts can be located vertically, horizontally or at any angle. Center distance can be short or long. No additional strength need be built into shafts and bearings as is often required by the extra load imposed on these parts by a drive dependent on tension for operation. All these features make roller chain the most compact, efficient, cost-saving drive for you.


Drive multiple shafts from a single power source
Can be used to reverse rotation of shafts
ROLLER CHAINS GIVE YOU THESE SPACE-SAVING ADVANTAGES:
Equally efficient on long or short centers
Require less wrap-around sprockets on a big reduction drive

For all the facts on how roller chains can help you save space in your designs, write Baldwin-Duckworth Division of Chain Belt Company, 367 Plainfield Street, Springfield 2, Mass.

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ROLLER CHAINS
BALDWIN-DUCKWORTH DIVISION OF CHAIN BELT COMPANY

newsprint at Sittingbourne on behalf of an American publisher. The necessary pulp has been purchased from the Bowater Newfoundland Company and is being shipped to England where Edward Lloyd, part of the Bowater Concern, will manufacture the newsprint. It will be recalled that Edward Lloyd possess one of the largest newsprint machines in the world, being 320 inches wide and stated to be capable of production at the rate of 1,000 feet per minute. This machine was erected in 1936, but unfortunately since the beginning of the war has been out of action. Incidentally, in connection with newsprint it has just been announced that the price of home produced newsprint is to be reduced by £4 per ton. This price reduction is due, it is stated, to lower production costs owing to permitted increased production.

The British Paper Trade is now experiencing the first return to a buyers' market. Despite the inability of the papermakers to produce on every occasion prewar standard papers on practically war time sub-standard materials, buyers are becoming more selective and the willingness to accept any paper available notwithstanding its condition no longer apertains. As both production and importation are far below prewar, it is obvious that this selectiveness is not due to consumption limits having been reached but entirely the outcome of artificial restrictions as the result of controls operating in many directions. Given free and unfettered use of paper and paper board for catalogues, posters, packaging and the many other uses together with a return to normal and healthy book publishing, particularly text books, there would be little difficulty in disposing of all available paper. Private enterprise house building, for example, in prewar days issued thousands of brochures. For some months past this form of building has been stopped and even with its present resumption it is only allowed 20 per cent of the licenses, the balance going to the local councils.

▼

CONSOLIDATED PAPER CO. CONSIDERS MERGER WITH AHDAWAGAM PRODUCTS

Merger of the Ahdawagam Paper Products Company into the Consolidated Water Power & Paper Company is being submitted to stockholders for approval at special meetings. Both companies are located in Wisconsin Rapids, Wisconsin.

It is proposed that one and a half shares of Consolidated capital stock be exchanged for each share of Ahdawagam, and it was indicated that after the merger a 50 per cent stock dividend on Consolidated stock would be authorized.

Consolidated has had operational control of Ahdawagam, and all paper used by the latter firm in manufacturing paper boxes and cartons has been made by Consolidated for the last twenty years. George W. Mead is president of both companies. Under merger plans, Ahdawagam would continue to operate as a division of Consolidated, with Frank R. Walsh continuing as manager.

The Consolidated company also has been considering purchase of 22,000 acres of county owned lands in Langlade County, Wisconsin, for its industrial forestry program. Under the plan, the firm would employ local labor for tree planting, road building and other development work, and would not prohibit hunters, trappers and fishermen from operating on the land.

▼

FINANCIAL

▶▶▶ THE STOCK MARKET break to new levels for more than a year, which came at the time of the Democratic National convention and the call for a special session of Congress and at the time of the Berlin crisis, saw paper mill securities drop sharply, but in most instances much of the loss was later recovered leaving net changes comparatively small as compared with a month ago. Most of the break came in common stocks with the inherent soundness of the industry's technical position reflected in steady prices for preferred issues.

American Box Board Company—Net income for six months ended June 30 was $980,663 as against $587,869 for the same period in 1947.

Champion Paper and Fibre Company—Net income for the year ended April 30 was $8,540,040.

Chesapeake Corporation—Net income for twenty-four weeks ended June 13 was $1,538,009 as compared with $1,689,440 for the comparable period a year ago.

Container Corporation—Net income for three months ended June 30 was $2,103,081 as against $2,482,289 for the comparable period a year ago. Net income for six months ended June 30 was $4,215,911 as against $5,664,668 for the same period a year ago.

Crown-Zellerbach Corporation—Net income for the fiscal year ended April 30 was $19,614,698 as compared with $15,053,306 in the previous year.

MacAndress & Forbes Company—Net income for six months ending June 30 was $603,536 as against $596,282 for the same period in 1947.

Mead Corporation—Net income for twenty-four weeks ended June 13 was $2,303,485 as compared with $2,466,220 for the comparable period a year ago.

Minnesota and Ontario Paper Company—Net income for the six months ending June 30 was $3,060,375 as compared with $2,635,775 for the same period in 1947.

National Gypsum Company—Net income for the six months ending June 30 was $3,337,537 as against $2,531,446 for the same period in 1947.

Rayonier, Incorporated—Net income for the six months ending June 30 was $5,012,251 as against $3,845,080 for the first six months of 1947.

St. Regis Paper Company—Net income for six months ended June 30 was $8,744,935 as compared with $7,696,147 for the same period in 1947.

San-Nap-Pak Mfg. Company—Net income for 1947 was $1,130,890 as compared with $876,580 for the previous year.

Scott Paper Company—Net income for six months ended June 30 was $1,633,092 as compared with $1,224,234 for the same period in 1947.

Soundview Pulp Company—Net income for six months ended June 30 was $2,899,705 as against $3,071,450 a year ago.

Union Bag & Paper Corporation—Net income for the three months ending June 30 was $3,621,212 as compared with $3,071,601 for the same quarter a year ago.

Paper Mill Corporate Changes

Jessup & Moore Paper Company—*The New York Evening Post* has sold its controlling interest to a group affiliated with the Knickerbocker Printing Corporation of New York. The former officers have resigned and John H. Brewer, formerly with Carter, Rice & Company of Boston is to become vice president and general manager in complete charge of manufacture and sales.

San-Nap-Pak Mfg. Company—In order to finance expansion and diversification, the company has increased its long term debt to $4,568,500 and has sold 32,079 shares of 70 cent cumulative preferred at $11 representing a premium of over $80,000. With the added funds the company has acquired the National Insurance Company of Denver and the American Druggists Syndicate, Inc.

National Container Corporation—The tenth converting plant operated by National Container is the former sheet plant of Kraft Containers, Inc., of Minneapolis, which now becomes a wholly owned subsidiary under the name of National Container Corporation of Minneapolis.

Lily-Tulip Cup Corporation—A special meeting of stockholders is ex-

UNION PACIFIC

The Governor of Kansas *invites You*

STATE OF KANSAS
OFFICE OF THE GOVERNOR
TOPEKA

FRANK CARLSON
GOVERNOR

To American Industry:

Kansas has matchless and abundant resources which await only the magic touch of industry to spread their benefits to the world. Its rich soil produces the essential foodstuffs of life. Beneath the surface is stored in abundance cheap energy to turn the wheels of industry. The possibilities of rich reward are limitless.

The facilities of the State, including the active and aggressive Industrial Development Commission, are pledged to offer every encouragement and assistance in working out the problems of new industries seeking to process and distribute the great natural resources of Kansas, which furnish fertile and almost virgin soil for aggressive modern development. A thorough investigation is always welcomed. Modern transportation permits products of Kansas industry to radiate cheaply to all parts of the country.

Sincerely,

Frank Carlson
Governor

Frank Carlson

* One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.

Unite with Union Pacific in selecting sites and seeking new markets in California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming.

*Address Industrial Department, Union Pacific Railroad
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UNION PACIFIC RAILROAD

Road of the Daily Streamliners

pected to authorize increasing the common stock from 250,000 to 500,000 shares and to authorize a 30,000 share issue of $100 par preferred. The additional shares of preferred if issued will be sold to insurance companies, but the additional common stock will not be offered at this time.

New York Stock Exchange—Stocks

	Closing Prices July 26, 1948	June 25, 1948
A.P.W. Products	5½	6
Celotex	30⅝	34⅝
Same Preferred	19⅜	18¾
Certain-teed Products	18	18¾
Champion P & F Co.	*23-23½	24¾
Same Preferred	*98½-100	98¼
Chesapeake Corp.	*28⅞-29½	28
Container Corp.	35⅞	37⅝
Same Preferred	95	*98-99
Continental Diamond	10⅞	11⅝
Crown Zellerbach	31⅛	31¾
Same Preferred	100½	100¼
Same $4 Preferred	116½	117
Dixie Vortex	36½	38½
Same "A"	52	*49-50
Robert Gair	8¼	9
Same Preferred	18¾	18½
International Paper	57¾	60
Same Preferred	98	98¼
Kimberly Clark	22	21
Same Preferred	*103¼-104	101½
McAndrews & Forbes	*36½-38	39
Marathon	*21¾-22¼	22
Masonite	66¼	67½
Mead Corp.	19⅜	20⅝
Same Preferred	93	94¾
Same 2nd Preferred	*38¾-42	42
National Container	11⅞	12⅛
Paraffine Cos.	25	25½
Same Preferred	*103½-105	105
Scott Paper	*46¾-48½	49½
Same Preferred	93	93
St. Regis	12⅛	12⅝
Same Preferred	90½	98¼
Sutherland Paper	*40¾-42	43
Union Bag & Paper	33¾	36¾
United Board&Carton	11¾	13⅞
United Wall Paper	4¾	5¼
Same Preferred	28½	27
U. S. Gypsum	103	110
Same Preferred	174¼	176
West Va. P. & P.	47⅛	49
Same Preferred	*107¼-108½	113

New York Stock Exchange—Bonds

Celotex 3½%	.....	.....
Champion P.&F. 3%	100⅞	.....
Certain-teed 5½%	.....	.....

New York Curb Exchange—Stocks

Am Writing	6⅜	7⅛
Great Northern	40	42¼
Taggart	10	11

*Closing Bid and Asked Prices.

▼

ACE-TRIUNE CORP. MOVES CHICAGO CARTON PLANT TO WHITE PIGEON, MICH.

Removal of the Ace-Triune Corporation's carton plant from Chicago to White Pigeon, Michigan, will begin shortly. John Plantefaber, executive vice president and general manager, said the corporation has purchased the White Pigeon carton plant of the Wolverine Carton Company, of Grand Rapids, and will use the facilities of this plant for the Ace-Triune operations. Activities and machinery of the Wolverine plant are now being transferred to Grand Rapids.

New equipment will be installed throughout the White Pigeon plant, with operations scheduled to start in September. It is anticipated that a larger operation than was carried on by Wolverine will be developed by Ace-Triune. The Wolverine company had employed about thirty-five persons while Mr. Plantefaber stated the Ace-Triune plans call for about seventy-five persons on the payroll.

Mr. Plantefaber said the Ace Carton Company, of Chicago, will have an interest in the new plant. He had no comment at present on a report that the Rocky River Paper Company at White Pigeon, with which he also is associated, is leasing space in the Eddy Paper Company's old No. 3 mill at Three Rivers, now owned by the International Paper Company.

▼

CONSTRUCTION TO START THIS YEAR ON INDIA'S FIRST NEWSPRINT PLANT

A newsprint factory for producing 30,000 tons annually will be built in India this year. Production will start in this first newsprint plant in India by June, 1949.

Unlike factories of the West, the plant will not use the costly and scarce spruce and fir trees, but a broadleaf tree which grows in 5,000 square miles of forest in the Central Provinces of India. The finished product will be of a very fine grade and superior in strength and quality to what is being made in the factories of the West, according to a report made after ten months' experiments by Dr. Campbell, Canadian expert in newsprint technology.

The Indian method was developed by P. N. Nair, a Government employee, who became aware of newsprint scarcity when his publisher wife found great difficulty in obtaining paper. A previous attempt to manufacture newsprint in India had failed because it was uneconomic to use the spruce and fir which were found only on Himalayan heights. Later, the Government Forest Research Institute at Dehra Dun tried with deciduous trees, but the resulting paper was too weak to run on a fast-moving rotary machine.

The Canadian government has lent the services of Robert A. Rankin, consulting industrial engineer of Montreal, and A. M. Koroleff, director of Woodlands Research, Pulp and Paper Research Institute, Montreal, to help in setting up the factory.

The factory will be located 3½ miles from Chandni, a small railway station on the Bombay-Delhi line. At present it is thick forest, and tigers roam freely over the area. The first 500 acres of land, new being cleared, will hold a township of 30,000 people.

The factory's authorized capital is $15,000,000 of which only $4,500,000 will be issued. The Government of the Central Provinces has agreed to take 10 per cent of the share capital, and to give the Nepa Mills (National Newsprint and Paper Mills Limited), which owns it, all the needed facilities. The present capacity of the Nepa mills is 100 tons a day, but it will be increased to 300 tons within five years.

▼

FIRE DESTROYS PLANT OF PHOENIX PAPER MFG. CO.

The Phoenix Paper Manufacturing Company, Inc., plant was destroyed July 14 in a spectacular fire that for a time threatened the village of Phoenix, New York.

Company officials said the blaze started inside the building behind some drying machines. The cause was unknown. Four employees were working in the building when the fire broke out, but no one was injured. The fire fighters prevented the blaze from spreading to nearby homes and to four other paper mills which are located along the Oswego River.

The company also operates a plant for the manufacture of toilet tissue, but this building was not damaged.

▼

NEW KAMYR WET MACHINE GOES INTO PRODUCTION AT HALIFAX PAPER CO.

A milestone in the history of the kraft paper plant of the Halifax Paper Company, Inc., was observed recently as a new Kamyr wet machine went into full production. This machine, the second of its type in the mill, increases pulp production from 200 to 300 tons per day.

Installation of the new Kamyr machine is part of a program of major improvements and modernization at the paper company plant costing well over a million dollars. Construction is being handled by C. M. Guest and Sons of Anderson, South Carolina, with planning by the engineering firm of J. E. Sirrine Company, Greenville, South Carolina.

In addition to the Kamyr machine, other improvements being put in by the Guest company include a Combustion Engineering Company recovery unit. Washing and screening facilities are also being revamped. It is estimated that the entire program will take a year to complete.

The Halifax Paper Company plant is located in Roanoke Rapids, North Carolina, and is a wholly owned subsidiary of the Albemarle Paper Company, of Richmond, Virginia.

from birch and aspen *now* come semi-chemical pulps

1

Partially cooked birch chips from digester—(actual size).

ABUNDANT and fast growing, these hardwoods are capable of vast increases over standard yields after sodium sulphite treatment followed by SPROUT-WALDRON refining.

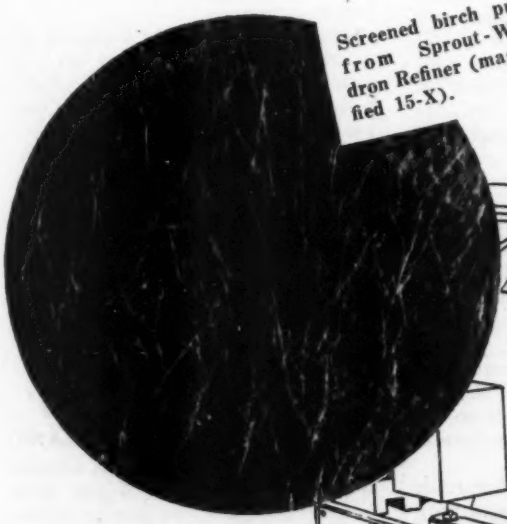
Readily bleached and with high initial strengths, such pulps may be substituted for bisulphite in book and comparable grades.

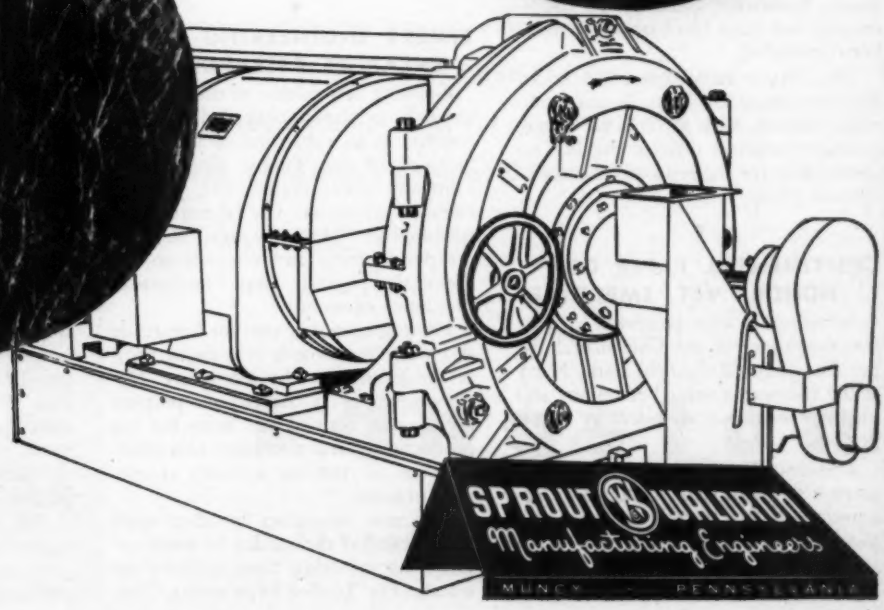
Low power and high increments of clean, uncut fibers, offer inducement to serious consideration.

SPROUT-WALDRON offers you its technical knowledge and experience in consultation.

2

Screened birch pulp from Sprout-Waldron Refiner (magnified 15-X).





44-C

NEKOOSA-EDWARDS BUILDS NEW RESEARCH LABORATORY

Nekoosa-Edwards Paper Company, Port Edwards, Wisconsin, has added the finishing touches to the new Nepco research and development laboratory in the mill office building in Port Edwards. Space for the new research laboratory was provided when the mill offices were remodeled last September, but not all of the furnishings and equipment were available until recently.

Among the important operations to be performed in the new laboratory are experiments on materials that can be added to papers such as coatings, sizings and impregnants. The laboratory will also be used for certain specialized tests on new products developed on the Nepco experimental paper machine. The steps in the development of the new products might include a preliminary investigation in the research laboratory, a pilot plant trial on the experimental paper machine, and commercial trial on the machines.

Facilities of the new laboratory include a Kewaunee metal laboratory bench with metal drawers and cabinets and a Kemrock top. Hot and cold water, gas, a-c current and steam are supplied at convenient outlets along the full length of the working area. The benches in the new laboratory are equipped with individual up-draft fume hoods for the removal of gases and odors. All testing equipment is of the very latest design.

In addition to the construction of the new research and developmental laboratory, the general laboratory was modernized throughout. In both the new laboratory and the general laboratory acousti-tile ceilings, asphalt tile floors, fluorescent lighting, air conditioning and glass block windows have been provided.

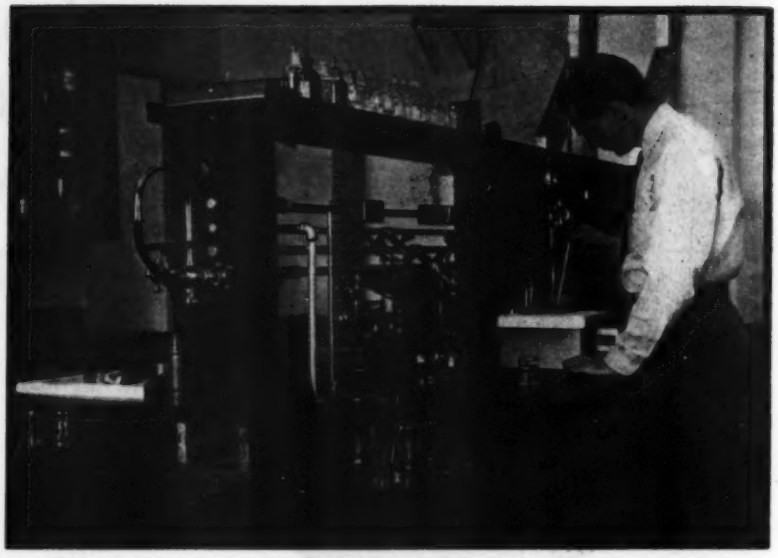
The Nepco laboratories are under the direction of Dr. T. A. Pascoe, technical director, with Dr. H. W. Rowe, assistant technical director, having responsibility for the research and development group.

▼

CONTINENTAL PAPER CO. HONORS VET. EMPLOYEES

Service pins were presented to fifty-two employees of the Continental Paper Company (Ridgefield Park, N.J.) at the company's annual ceremony and picnic which was attended by 1,000 persons.

President William J. Alford, Jr., was given a pin with four diamonds in recognition of his thirty-five years with the firm. Henry Dobias received a pin set with 3 diamonds in recognition of thirty years with Continental. Six other employees, upon completion of twenty-five years of service, were each presented with Savings Bonds, in addition to special pins. Eight employees were in the 20-year group, four in the 15-year class, four in the 10-year class, and 36 in the 5-year group.



New research laboratory in the mill office building of Nekoosa-Edwards Paper Co., Port Edwards, Wis.

▼

▶▶▶ AN OPINION has been handed down by the U. S. Circuit Court of Appeals in a patent infringement action brought by Dixie Cup Company (Easton, Pa.) against Paper Container Mfg. Company, Chicago. The Circuit Court affirmed the lower Courts finding and its own earlier holding of infringement against Paper Container and in favor of the Dixie company.

▼

TIMBER ENGINEERING CO. ENLARGES RESEARCH LAB.

Growing recognition of the value of research to the lumber industry has resulted in an expansion of plant and facilities of the Timber Engineering Company (Washington, D.C.) wood research laboratory. The laboratory, established in 1943, is engaged in product development and research on the chemical, physical, and mechanical properties of wood.

Finding economic uses for low-grade and waste hardwoods is a major project under way at the laboratory. Development of a hardwood pulping process has formed the basis for the production of many valuable new products out of material formerly considered unusable.

The new laboratory building itself is a tribute to the strides in wood engineering resulting from industry research. The Timber Engineering Company, an affiliate of the National Lumber Manufacturers Association, has offices at 1319 - 18th Street, N.W., Washington, D. C.

▼

U.S. & CANADIAN MILLS RAISE NEWSPRINT PRICES

Newsprint mills in the United States and Canada have announced increases in the price of standard newsprint approximating $4 per ton, effective August 1.

Great Northern Paper Company increased its price only $3 per ton, but such companies as Powell River Company, Ltd., International Paper Company, Abitibi Power & Paper Company, Ltd., and Crown Zellerbach Corporation, set the higher figure. The new prices are $99 per ton.

The explanation of the increase, initiated by Canadian companies, is ascribed to higher costs which are greater than the increased price, according to International officials.

▼

FT. WAYNE PAPER CO. PLANS IMPROVEMENT OF CORRUGATED BOX PLANT

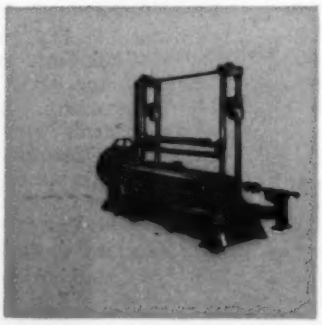
The awarding of a general contract to Wermuth, Inc., Fort Wayne, Indiana, at $750,000 for immediate improvement and rehabilitation of the Fort Wayne Corrugated Paper Company's corrugated box plant at Hartford City, Indiana, has been announced by Harold M. Treen, president. Completion is scheduled for November 1.

The project is part of a long-range expansion program started by the company in 1938. The Hartford City improvement will about complete the

Smooth

Every Langston Slitter is built up, part by part, on a heavy bedplate. This strong foundation, on which the sturdy box section side frames rest, assures increased rigidity *and a much smoother running machine.* Langston Slitters and Roll Winders produce hard centered, uniform rolls cut clean and true.

Samuel M. Langston Company, Camden, N. J.



Langston

SLITTERS AND ROLL WINDERS

planned expenditure for converting facilities totaling approximately $3,000,000 since the start of the program.

The Hartford City improvements include construction of a boiler house for generating steam, modern facilities for handling fuel and ashes, and reconstruction of buildings designed to accommodate more efficient production and provide adequate and convenient space for office, receiving, shipping, and quality control laboratory.

Plans for the new project were developed by R. P. Getty, vice president in charge of manufacturing; E. E. Moreland, plant manager; and Loren F. Ashwood, company engineer. E. Paul Birk, Chicago, was consulting engineer.

The closing of the Fort Wayne Corrugated Paper Company's jute paperboard operations at Hartford City was announced on page 544 of the July, 1948, issue of THE PAPER INDUSTRY AND PAPER WORLD.

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▶▶▶ TWO APPOINTMENTS to the Pulp and Paper Division of the Economic Co-operation Administration are those of Howard E. Whitaker, operating vice president of the Mead Corporation, and Alex Craighead, of the Mead Sales Company. They have been appointed acting chief and deputy chief respectively. Mr. Whitaker will have charge of the study of foreign requirements in the pulp and paper field and is not new to governmental activities, having been in various similar positions during and just after the war.

▼

MEMORIALS OFFERED IN HONOR OF PAUL D. BRAY

Two donations in memory of the late Professor Paul D. Bray (see Necrology) made by his colleagues, fellow-workers, and students, have been received by the department of chemical engineering at the University of Maine, Lyle C. Jenness, acting department head has announced.

The first fund, raised through the efforts of staff members and employees closely associated with Professor Bray, will be used to purchase a five-volume set of text books covering the pulp and paper field. This work, entitled *The Manufacture of Pulp and Paper,* is now undergoing revision under the auspices of the Technical Association of the Pulp and Paper Industry, of which Professor Bray was a charter member. The books are to be donated in his honor to the chemical engineering department for reference use.

A second fund has been donated by Professor Bray's former students. This gift will be used to purchase the Paul D. Bray Memorial Plaque, to be on display in Aubert Hall. Each year the name of the highest ranking student in the pulp and paper division of the department of chemical engineering will be inscribed on this plaque.

In making the announcement, Professor Jenness expressed appreciation on behalf of the department and the university for the generous contributions by Professor Bray's many friends.

▼

EQUIPMENT FOR PROPOSED NEWSPRINT PLANT STORED

Shipment of equipment to storage in Portland, Oregon, has led to the belief that the proposed newsprint mill to be built on the Pacific Paperboard Company site at Longview, Washington, will not materialize. Approximately $1,000,000 has already been spent by a California newspaper syndicate making a fill, driving piling, building a railroad spur, and starting construction.

Construction was suspended in June, with engineers reporting that design changes were the reason. Late in July orders were issued to start moving equipment designed for the plant from the Port of Longview warehouse to storage in Portland.

▼

HAWLEY COMPANY BUSINESS TAKEN OVER BY NEW OWNERS

An announcement has been sent to the trade stating that on August 1 the Hawley Pulp and Paper Company, Oregon City, Oregon, was liquidated by its stockholders as a corporation and its operating properties and business were taken over by Publishers' Paper Company (Cf. P.I. and P.W. April, 1948).

It is stated that there will be no break in the continuity of operation and that existing commitments will be fulfilled by the new owner.

▼

IMPORT NOTES

The various reciprocal trade agreements are resulting in a large variety of new problems of classification of imported papers, according to Warren B. Bullock, manager of the Import Committee of the American Paper Industry. Imports of recognized grades on which duty rates were reduced by the various agreements with papermaking countries are increasing. Among the new problems for determination are the following:

Laminated paper with one sheet corrugated as a protective wrapping, claimed dutiable as wrapping paper, but believed by the Import Committee to be dutiable at a higher rate as a manufacture of paper; paper bags made of surface decorated paper, claimed dutiable at the rate for manufactures of paper; wood veneer on paper, claimed dutiable as uncolored hanging paper; toilet paper in rolls, claimed to be dutiable at the rate for manufactures of paper, and not at the higher rate for tissue paper; tarred kraft paper, claimed to be dutiable as sheathing paper; paper for a Florida newspaper, weighing over 35 pounds, and containing over 35 per cent sulphite, claimed duty free as standard newsprint; paper napkins and doilies, claimed to be dutiable as paper cut into shape at 15 per cent, believed to be dutiable as manufactures of paper at 35 per cent.

Greaseproof paper imported at Rochester, New York, claimed dutiable at 1 cent per pound and 5 per cent as vegetable parchment, has been classified for duty by Customs officials as greaseproof paper at 3 cents per pound and 15 per cent.

▼

▶▶▶ SEVEN FLORIDA pulp and paper mills are among the financial supporters of the 14th annual forestry training camp for delegates from the Florida chapters of the Future Farmers Association. The American Turpentine Farmers Association and the Southern Pine Association have joined with the members of the Southern Pulpwood Conservation Association in supporting the camp.

▼

18 PAPER COMPANIES WIN PLACE TO BE JUDGED FOR OSCAR OF INDUSTRY AWARD

From the more than 4,000 corporation annual reports submitted from all over the country for consideration in the Eighth Annual Survey, conducted by Weston Smith, of *Financial World,* eighteen pulp and paper companies (listed) have qualified for Highest Merit Award citations:

British Columbia Forest Products
Brown Company
Champion Paper & Fibre Company
Crown Zellerbach Corporation
Eddy Paper Company, Ltd.
Great Northern Paper Company
Hammermill Paper Company
Hoberg Paper Mills
International Paper Company
Kimberly-Clark Corporation
Marathon Corporation
Mead Corporation
Nekoosa-Edwards Paper Company
Oxford Paper Company
Riegel Paper Corporation
St. Regis Paper Company
Howard Smith Paper Corporation
West Virginia Pulp & Paper Co.

The 1947 stockholder reports of these companies will be used for final

AN ENCYCLOPEDIA OF CORROSIVE-HANDLING EQUIPMENT

36 TYPES OF EQUIPMENT MADE OF DURCO CORROSION-RESISTING ALLOYS

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Here is a new, 8-page general catalog issued by the largest organization in the world devoted exclusively to the production of *corrosion-resisting* alloys and equipment.

This catalog:

1. **Describes Durco corrosion-resisting alloys — Duriron, Durichlor, Durimet, Chlorimet, and Durco D-10,** stating composition, physical and mechanical characteristics, and names the corrosives for which each alloy is recommended.

2. Describes **Durco equipment** made of above alloys, as well as of **Monel, Pure Nickel, Inconel, Ni-Resist and Nickel Cast Iron.**

3. States **features** of each type of equipment, also **sizes, capacities** and the **alloys** in which it is available.

THE DURIRON CO., INC., DAYTON 1, OHIO

Branch Offices in Principal Cities

DURCO Adv. 53-GM

judging, and one will be selected as the "Best of the Pulp & Paper Industry" and awarded the bronze "Oscar of Industry" trophy at the *Financial World* Annual Report Awards Banquet on October 21, 1948, in the Grand Ballroom of the Hotel Pennsylvania in New York.

▼

NAT'L CONTAINER CORP. ACQUIRES SHEET PLANT

Samuel Kipnis, president of National Container Corporation, New York, has announced the acquisition by the newly organized wholly-owned subsidiary National Container Corporation (of Minnesota), of the sheet plant located in Minneapolis and formerly operated by Kraft Containers, Inc. At the same time arrangements were made with the former operators of the plant to act as selling agents in the territory surrounding Minneapolis.

This acquisition constitutes the tenth converting plant in the chain of plants operated by National Container Corporation, all of which receive their supplies of kraft board from the company's four mills.

What do you know about Paper?

DRAPER'S ATLAS of AMERICAN PAPERMAKING containing 37 maps of the States where paper is made, together with important facts and figures, answers many interesting questions and shows plant locations.

This forty-four-page book, cloth bound in board, will be mailed free on application to anyone actually engaged in pulp or papermaking. To others, the price is $2.00 postpaid, while the edition lasts.

The DRAPER Felt

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

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Ralph E. Briggs, Sales Manager

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WALTER A. SALMONSON, 519-20 White Bldg., Seattle, Wash. — L. L. GRIFFITHS, Jr., Kalamazoo, Mich.

Answer to Question No. 8 — Pennsylvania, New Jersey, Massachusetts

ARKELL & SMITHS SEEKS APPROVAL OF R.R. SPUR AT CANAJOHARIE PLANT

The board of directors of Arkell & Smiths has authorized a $100,000 modernization program at its Canajoharie, New York, plant providing a railroad siding can be constructed along the east side of the Canajoharie Creek from the main spur of the West Shore line to the plant.

C. J. Sittinger, consulting engineer of Arkell & Smiths, has recommended that any expenditure for improvements be held up pending the approval of the projected railroad siding, by the village board and conclusion of negotiations with property owners of the land over which the spur would run. The future success of the Arkell & Smith's Canajoharie plants depends upon the modernization and streamlining of production facilities, Mr. Sittinger pointed out.

In contrast, the Mobile, Alabama, and Wellsburg, West Virginia, bag plants of the company have all the advantages of rail siding and loading and unloading facilities.

▼

▶▶▶ A MACHINE SHOP and another building were destroyed in a fire at the Soundview Pulp Company's Camp 18 near Sedro Woolley, Washington, July 12. Damage estimated at $150,000 resulted from the flames which broke out in a section of the building where tires and tubes were stored.

▼

▶▶▶ A SERIOUS SHORTAGE of Norway pine cones for seeding at state nurseries this fall has brought a plea from W. H. Brener, superintendent of the Wisconsin Conservation Department nurseries, for volunteers to pick up cones, together with a promise of a substantial increase over last year's buying price of $5 a bushel.

▼

▶▶▶ COMPLETION OF a $1,500,000 plant at Tonawanda, New York, for The Container Company, a subsidiary of the Continental Can Company, is expected for this October. The company is scheduled to start production a month later with 240 employees on a daily basis. Its output will be 10,000 circular fiber containers of 12 to 75 gallons capacity per day.

▼

▶▶▶ ACQUISITION of the property of the Jessup and Moore Paper Company, Elkton, Maryland, by the Knickerbocker Printing Corporation, of New York City, has been reported. The plant has been owned for the past year and a half by the *New York Post*.

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A REVOLUTIONARY NEW LOCOMOTIVE CRANE

Seven tons of wearing parts eliminated!

Pays for itself in FIVE YEARS... as proved by long-term cost records.

40-TON POWER makes light work of big loads

DIESEL power to the deck; ELECTRIC power to the trucks

CLEAR-VIEW CAB lets operator see load at all times

DIESEL-ELECTRIC LOCOMOTIVE CRANE. PATENT NO. 2083469. TOUCH CONTROL. PATENT NO. 2370856.

Plant No. 2: So. Kearny, N. J.

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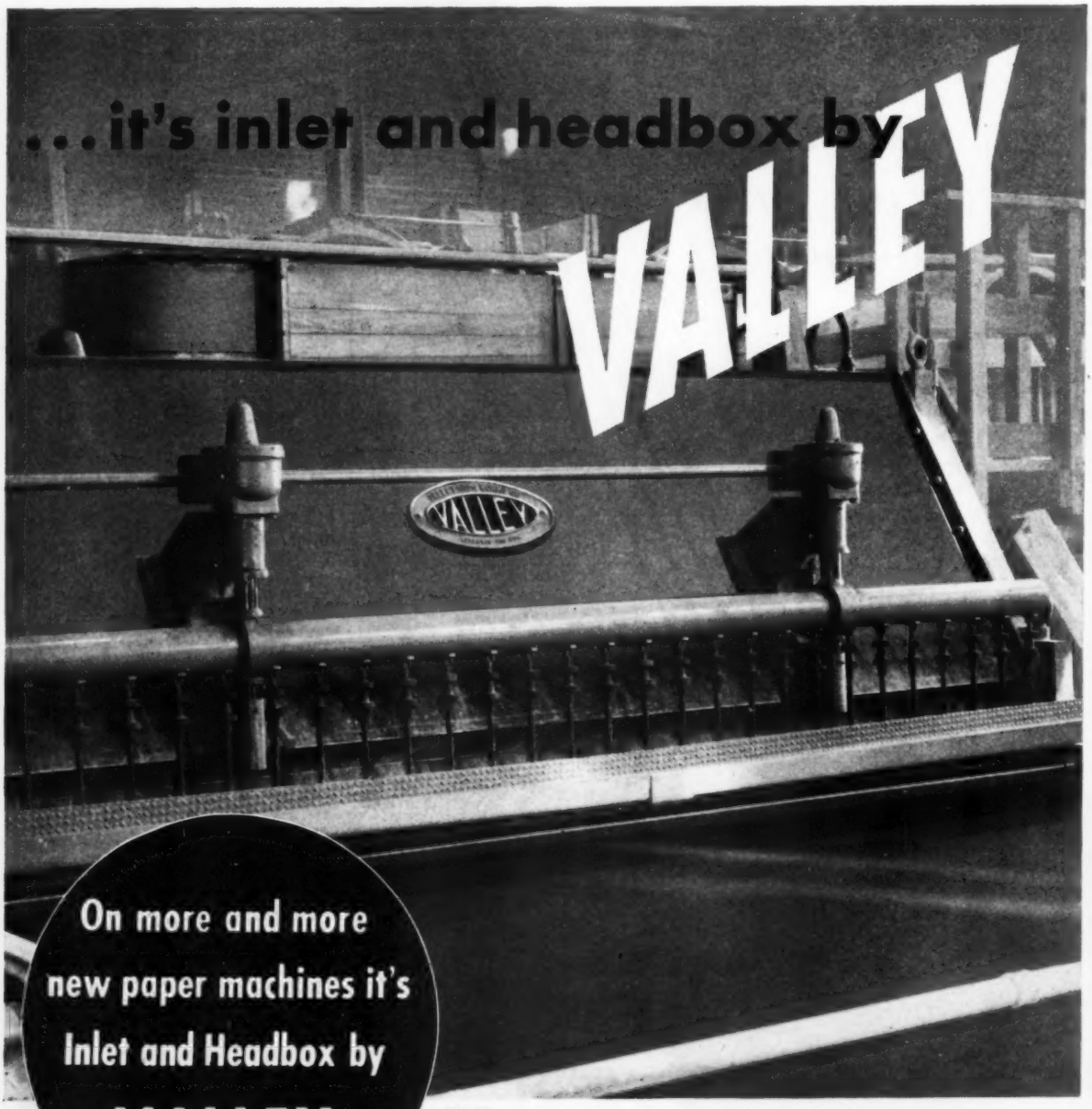

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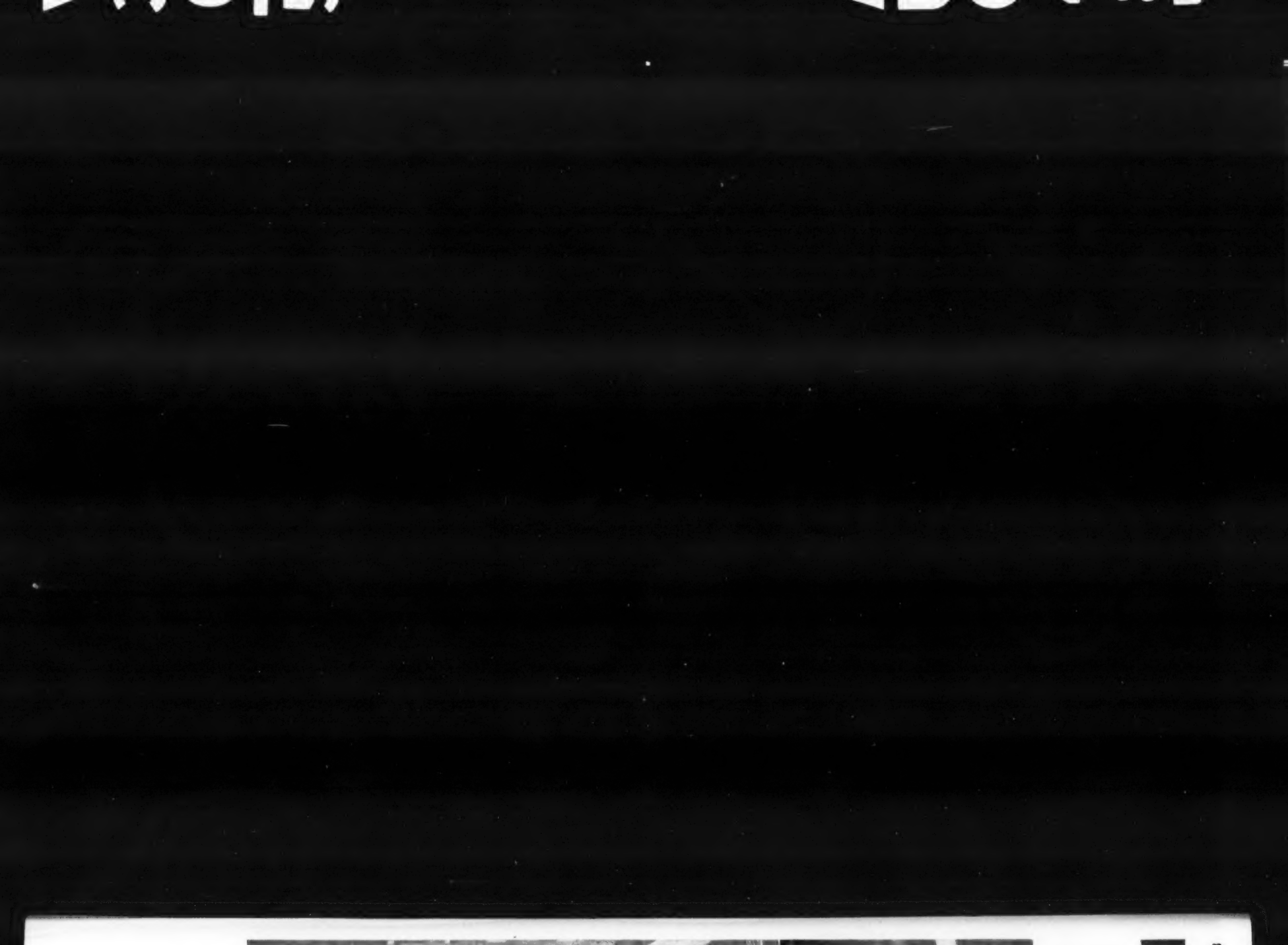

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PREFABRICATION IN THE SHOP

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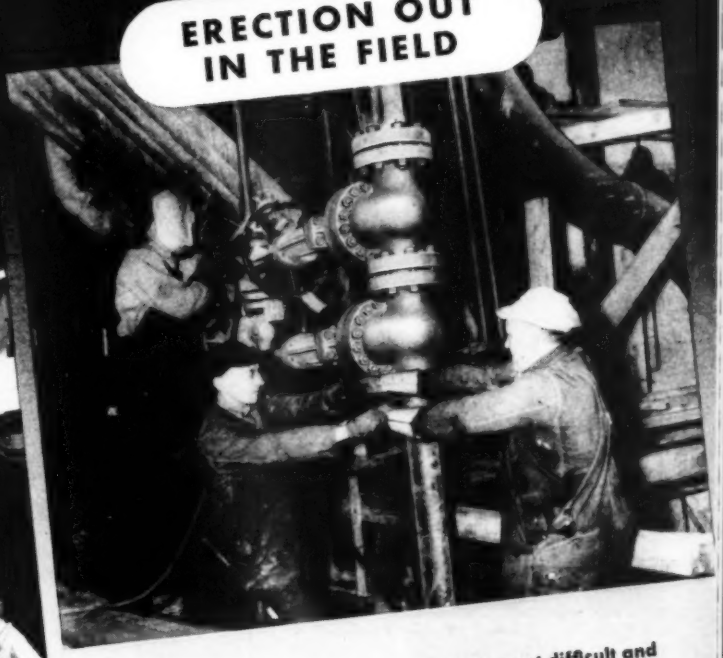

Because Midwest has erected some of the most difficult and exacting piping jobs out in the field, in addition to having prefabricated them in the shops, we have a clear, competent view of piping problems from every angle.

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The net result to you is better piping whether you want a simple pipe bend . . . a series of complex prefabricated subassemblies . . . or a difficult piping job completely erected.

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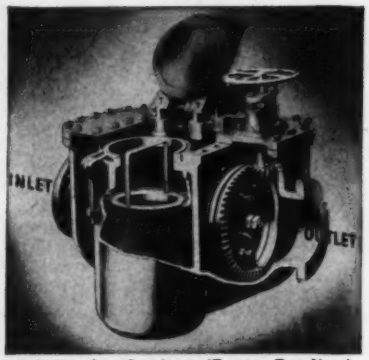
R-S Duplex Strainer Assures Clean Water

Utilities and industrial plants which must have clean water are showing keen interest in the new R-S Duplex Strainer because of its simple control features.

Single handwheel control by only 2½ turns permits alternate removal of identical basket strainers without interruption to flow. This is the feature which gives the R-S Duplex Strainer its striking advantage over the old-style 2-wheel control involving complete shut-off or flow during the cleaning operation.



R-S Duplex Strainer (Patent Pending)

Illustration shows that the valve is in continuous contact with the seat so that it cannot become fouled or loose. Further, the valve mechanism is on the downstream side, in contact with strained water only, not in the path of flow, and therefore less subject to erosion or wear. There is but one stuffing-box.

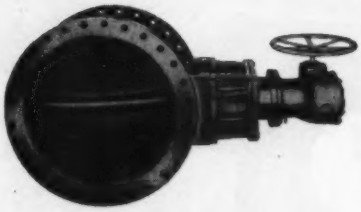
Four-inch to 24-inch pipe-sizes are available. Pressure loss is extremely low. The ratio of straining area in each compartment to the area of the inlet is approximately 3 to 1.

Descriptive material including tables, graphs, and drawings will be sent on request to R-S Products Corporation—Valve Division—Wayne Junction, Philadelphia 44, Pennsylvania.

New R-S Representative in Mexico

The R-S Valve Division announces appointment of a new representative covering all of Mexico. This is Equipos Hidraulicos de Mexico, S. A. Address: Edificio "Atlan", Avenue Juarez 76, Mexico, D. F.

NEW R-S 50-POUND CLASS B IRON VALVE



This new valve, R-S type B-9468, designed for rugged hydraulic service, is equipped with the R-S rubber spool (Type B-8934). Patent Pending.

The rubber spool combined with the wedge-type closure of the R-S angular seating disc provides positive shut-off for thousands of full-open to full-closed cycles. Despite its conservative rating as a 50-pound valve the new unit will give bubble-tight shut-off up to 80 p.s.i. air, and commercially tight shut-off at 100 p.s.i. water.

No Better Ad Than A Satisfied Customer!

Fischer & Porter Company of Hatboro, Pa., manufacturers of Indicating, Recording, Controlling, and Totalizing Flowrator instruments for flow-rate measurement and automatic flow control, recently wrote the R-S Philadelphia representative:

"You will be gratified to learn of the excellent success the R-S Butterfly Valves, supplied by you for our stock flow measurement control, have enjoyed.

"Our Canadian Field Engineer writes as follows on the R-S Valve:
'. . . it has proved a complete success in this service . . . this R-S control valve has created great interest in the Canadian trade. On a recent bleachery application, it was pointed out that had butterfly type valves been employed a saving of approximately half in valve costs could have been effected'."

William Diament
Vice President-in-charge-of-Sales

Proper Sizing Essential to Success of Regulating Valve

When installing the disc or butterfly type of valve, as developed by R-S Products Valve Division, it is important for best results that the greater capacity—2 to 3 times that of many conventional valves of the same size—be recognized. In regulating service a 6-inch R-S valve will often replace a 10-inch valve of other types. Naturally, with the smaller R-S valve, there is less metal to pay for, less machining to be done, and less load to support in the line. These advantages represent great savings in cost, especially when hard or high cost metals are specified to counteract unusual abrasive or corrosive conditions.

R-S to Display at Instrument Show

R-S Valves and valve controls, both manual and automatic, will be on view at the Third National Instrument Exhibit in Philadelphia, September 13 to 17. The new R-S Leveltronic Relay will also be an interesting feature of the exhibit.

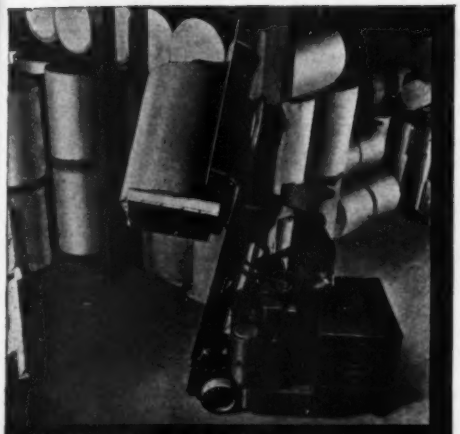
The rapid growth of the Instrument Show is a revealing index of the rising interest in Instrumentation as a science. It is a reflection, too, of industry's need to answer mounting labor costs by instrument control wherever hand labor can be replaced by automatic control.

The new R-S Leveltronic Relay will be of notable interest to instrumentation engineers because of its astonishing potentialities for control purposes. For example, the relay provides direct or reverse action giving fail-safe control of line failure and preventing overflow or underfilling of process units. Out-contacts sound an alarm, light a light, or shut the process down.

The New R-S Valve Catalog #17

R-S Valve Catalog #17 is packed with information for engineers. There are over 70 halftone pictures of R-S Valves . . . working drawings of 21 types of R-S Valves with standard controls and fittings and complete dimensional data for all sizes . . . working drawings of 22 types of prime movers . . . numerous other diagrams, graphs and miscellaneous drawings. Address R-S Products Corporation, Valve Division, Philadelphia 44, Pa.

JMLee P-GG1



ROLLS can be picked up from either position; transported, rotated 90°, and high tiered.

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Unequalled Experience in Paper Handling

PULP—By carrying palletized loads of laps on E-P trucks, accidents are avoided—time, man power and space are saved.

CARLOADING is often done in an hour by this E-P truck with rotating apron that picks up, transports, and tiers.

BALES of flax straw for paper specialties are high piled on skids into master loads, then carried to the bleacher.

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From the wealth of its 42-year experience, Elwell-Parker has originated many unique truck and crane attachments for the Paper Industry *exclusively*—and also has devised operating practices to insure greatest returns from their use . . . In transporting *every* type of paper load, through Mill, Plant and Warehouse, Ellwell-Parker's *longer* experience can help you speed production without interrupting present operations. This automatically increases safety. NEW profits follow.

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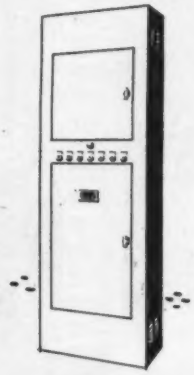
from Western Precipitation Corporation—pioneers of the commercial application of COTTRELL *and now selling* COTTRELL *recovery equipment in all parts of the U.S.A. and foreign countries.*

Various Methods of Energizing COTTRELLS *Make Experience a Vital Factor*

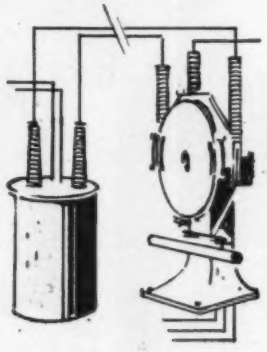
The many and varied factors affecting the operating efficiency of a COTTRELL Precipitator make experience and "know how" of the greatest importance in designing and installing COTTRELL equipment. Western Precipitation Corporation—*the organization that pioneered the commercial application of* COTTRELLS—has had over 39 years of first-hand experience in developing and perfecting the various elements that make up a complete COTTRELL installation, and these years of experience assure maximum performance from every Western Precipitation COTTRELL installation.

For example, the equipment for energizing Western Precipitation COTTRELLS include such features as the following . . .

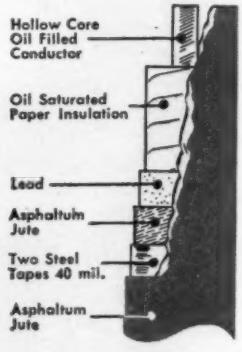
RECTIFIER SWITCHBOARDS—are of the Enclosed Cubicle type with flush-mounted meters, push buttons, selector switches, and indicating lights. The cabinet door and rectifier control circuit are interlocked. Rectifier and transformer contactors, instrument transformers, tap switches, terminal blocks and other auxiliaries are mounted inside the switchboard cabinet.



RAPPER AND POWER PANELS—are of the same external appearance as rectifier switchboards and can be installed beside rectifier switchboards to form a uniform and continuous switchboard installation. The cabinet is divided into two compartments—one containing AB breakers for control of all individual rectifier and signal circuits—the other containing all rapper controls and timers.



RECTIFIERS—for either full or half wave rectification. Mechanical rectifiers of the solid disc type are supplied with Radio Interference Correctors and Inductive Type Automatic Polarity devices. The Automatic polarity device has no commutator or brushes contacting high speed rotating parts. High voltage switch gear with interlocking control units is available.



HIGH VOLTAGE CONNECTIONS—between the rectifiers and the COTTRELL may be either special high voltage petrolatum-filled lead and steel-covered cable with pothead terminal connections, or of rod-and-bus-duct construction.

Watch for the next in this series which outlines the various* COTTRELL *electrode systems available from Western Precipitation Corporation.

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Western Precipitation can design COTTRELLS to operate at any desired efficiency, for *any* capacity, to collect virtually *any* solid or liquid suspended in a gas, whether hot or cold.

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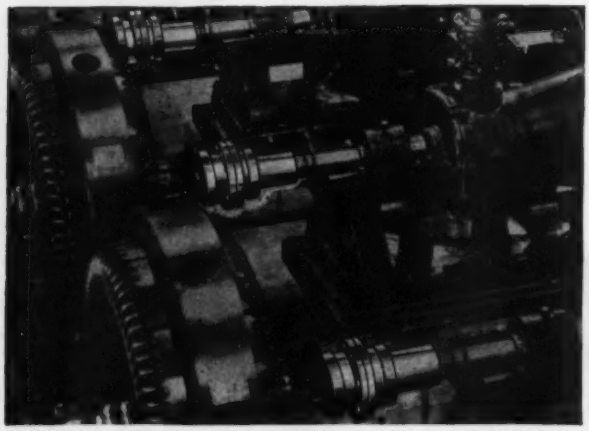
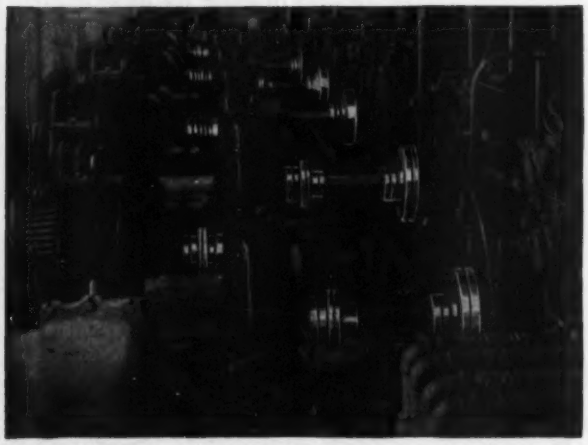
SPECIFYING Fast's self-aligning Couplings is the answer! No matter what your coupling problem, there's a Fast's made to solve it . . . and give you longer machine life, lower upkeep costs and minimum shut-down losses. For absolute dependability, these *original* gear-type couplings are built with many important features . . . such as an *exclusive* "rocking bearing."

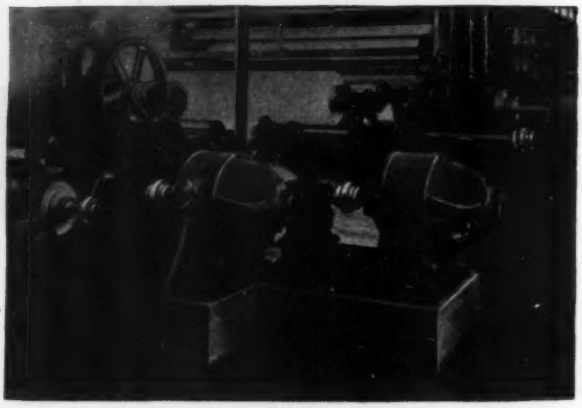


FOR JORDAN ADJUSTMENTS—Fast's Jordan-Type Couplings reduce wear on bearings, prolong life of motor and Jordan. Because the Fast's splines are meshed in oil, plug adjustment is smooth and certain. No worn spots can develop. The customary "hard spot" is eliminated. Due to smooth torque and elimination of coupling vibration, Jordan lining life is increased and the product discharged from the Jordan is uniform.



FOR REMOTE DRIVES—Fast's Floating Shaft Couplings enable drives to be set back from paper machines without the use of supporting bearings. This eliminates one piece of equipment—does away with the necessity of keeping three or more bearings in line—saves installation cost and eliminates upkeep, attention and replacement of bearings.

This bearing is *exclusive* in providing a positive metal-to-metal seal against wear-producing moisture, dust and grit. The bearing is also exclusive in its correctly engineered position which allows *freedom of movement* to compensate for misalignment because its *spherical* base has *the same axis* as the hub spline faces. And as a plus, Fast's Couplings give you the benefits of years of top engineering experience, Koppers' high standard of workmanship and unexcelled coupling service which assures spare parts no matter how old your couplings may be. For full information, mail the coupon below to: Koppers Co., Inc., Fast's Coupling Dept., 238 Scott St., Baltimore 3, Md.



FOR STANDARD APPLICATIONS—Fast's Standard Couplings are designed for use on all ordinary installations. They are made in shaft sizes from 1½" to 5".

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SEND FOR FREE CATALOG!

Gentlemen: Please send me your illustrated, informative catalog, giving full information on the many types of Fast's Couplings.

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Demand and Supply Still Control

▸▸▸ IN A MID-YEAR review of the nation's economy by the Commerce Department, issued last month, the experts conclude that "the people want to buy more goods than are available."

It appears, on breaking down the report, that the reason that demand is continuing so strong this year is because of the increased wages, the reduction of taxes, $4,800,000,000, and the increased government buying and expenditures.

These factors naturally operate to force prices upward, especially as there is but little increase in the supply of goods over that which was available in the fourth quarter of 1947.

The Federal Reserve Bank confirms this with its Index number of industrial activity standing at 192 in June of this year, compared with 190 in October and 192 in November and December of last year. So, here we are at the middle of the year with a volume business at 1947 high.

Says one business commentator—"prices are rising because demand is increasing and supplies are not." That is but another way of stating the operation of the law of demand and supply.

The converse of the present situation under demand and supply operation could be, 'if supplies were increasing and demand decreasing, prices would be declining." But this latter supposition is contrary to present-day fact. We must be realistic and adjust to the present economy operation on the basis of increasing prices, increased demand and short supplies.

There is no early hope, the report goes on to say, of production striking a more even balance with demand. "Most industries," it says, "have been operating at maximum levels consistent with available facilities and supplies of materials, particularly steel."

All of which means that in many industries, production is overtaking capacity, beyond which they cannot presently go, due to high cost of installation of increased capacity and shortages of raw materials, such as steel is facing in ores, and the paper industry in basic wood pulp.

"With supply holding steady," the experts said, "that demand is greater is shown by the following indicators, which have increased this year—consumer income, personal income, government procurement, commodity prices, employment and new construction."

The sum of the analysis is that for the year, 1948, the volume of business will be as great as, if not exceed, that of 1947 which totaled 230 billion dollars—and as for profits, the first six months of 1948 showed corporation profits of $1,644,181,000 compared with $1,437,533,000 for the first six months of 1947—a neat net increase of $206,648,000.

As we come into the fall activities of the Nation, it appears that our American economy is facing a rather better outlook for better operations than it has at any time since V-J Day—and all of this in spite of the fact that election years are reckoned as years of uncertainty.

A Door Unlocked After Thirty Years

▸▸▸ THE EFFORTS OF the Forest Service of the U. S. Department of Agriculture to unlock the vast timber resources of Alaska to the pulp and paper industry seem to have culminated successfully. After thirty years of planning, the first unit of the Tongass National Forest has been taken over by a company in the paper industry; the Forest Service expects that an additional five or six forest units will be sold and that a stable industry will be established in Alaska.

The timber resources of Tongass National Forest are almost entirely high grade pulping species, predominantly western hemlock (74 per cent) and sitka spruce (20 per cent) with small amounts of western red and Alaska yellow cedars.

Preliminary studies of yield in the forest indicate that rotation on an average of about 80 years would greatly increase the volume per acre over the average volume found in the virgin commercial forest, now estimated at 78,500,000,000 board feet. Under sustained-yield forest management, this would mean that an industry could take from the forest each year approximately 1,600,000 cords of wood.

Climatic conditions in Alaska do not present as much of a problem as is generally believed. The warm Japanese current provides the Alaska Archipelago with a moderate climate unparalelled in any other region of the same latitudinal position. At sea level, snow rarely remains on the ground during the winter, and the streams and protected waterways are ice-free the year round. The principal obstacle is the fact that winter days are generally too short to make operations worthwhile; otherwise, year-round logging would be possible. As it is, nine full months can be considered as the usual extent of the logging season.

It has taken eighty-one years since the acquisition of a rugged land, then termed "Seward's Folly," for the pulp and paper industry to enter this vast bonanza.

BETWEEN THE LINES

The High Cost of Peace

▶▶▶ WAR IS TO PEACE as lightning is to thunder—if we suffer one, we must endure the other. It is inevitable that peace must be bought, and practically nothing that affects our existence escapes its share of assessment for the cost. Oddly enough, the time of war is defined; the monetary cost, however great, becomes national statistics. But the dove of peace flaps its wings and soars high, and higher, until it is forced down for refueling. Yes, the cost of peace goes on and on; when the total is averaged, every nation pays a perpetual tax on peace.

The main topic of concern among businessmen and citizens is the inflated cost of practically everything necessary to existence. It's something like that familiar, oft-repeated saying that "Everybody talks about the weather, but nobody does anything about it." There is much accusation by political parties, blaming the other side, and most of the large national organizations clamor for a hearing of their reasons for mounting costs.

But dress it up as they may, it's like the wolf peering out from under grandmother's cap and saying to a frightened child in a red coat, "The better to eat you with, my dear." For it is an old law that high prices will remain only as long as the public is willing to submit to them. Many housewives with an ample allowance will buy sirloin steak at more than a dollar a pound. If the housewives joined together and refused to buy food at unreasonably high prices, the grocers and butchers would be compelled to sell cheaper and pass the loss back down the line. But if the housewives did organize and refuse to buy and the husbands went on strike for more wages, the economy of the nation would be out of balance on the other side. Seems as though the wage earners and the homemakers will have to co-operate in working out some new *modus operandi.*

Buyer resistance or government control of prices are the best known antidotes for inflation. The latter method, though unquestionably effective while it lasts, smokes out the profiteers who start black markets. And since control can't last indefinitely in a democracy, we as citizens must learn to curb our wants until the scales balance.

▶▶▶ ALL'S FAIR in the Midwest this summer. We don't mean the weather, though it might be worse, but there are FAIR-sized miniatures of A Century of Progress now drawing crowds on Chicago's lake front and in Milwaukee, Wisconsin.

The Chicago Railroad Fair commemorating the hundredth anniversary of the opening of the West by rail transportation is a leading attraction. For young children, it's a story out of history books, with particular accent on the progress of transportation. The oldsters go to the Fair and have a great time riding on the "Old Pioneer" over a mile-long narrow-gauge railroad, a replica of the same equipment that connected the East with the West. But they complain no end when they can't get a strap in the subway or have to miss a crowded bus—they just must get home in time to hear that quiz show, they just might get called tonight. Besides, they know the answer to the current question and that hundred dollars would come in mighty handy. The youngsters are more interested in the Train of Tomorrow and start planning how they may some day take a trip in those astra dome cars.

▶▶▶ PREPARATION for Wisconsin's Centennial Exposition has been going on for the past two years. It's called a "Show of a Century," and one columnist refers to it as a world's fair in short pants. It must make some of the visitors "pant," to keep from missing all of the splendor exhibited to the tune of six and one-half million dollars. That Fortune has smiled upon this state is symbolized by the gold and silver displayed all around. There is Golden Boulevard, the color blending with the hue of Silver Street. Of the 22 exhibit halls, the largest one is labeled "Wisconsin at Work." Shown here are movies of paper mills in the state. A complete line of industrial exhibits also may be seen.

Peculiar, isn't it, how people will pass an industrial plant or some very celebrated spot in their locale without paying much attention; but they will go to a Fair and pay admission to find out what goes on inside.

Maybe this is why we fight wars and are willing to pay for peace.

—By Bessemer

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- Aqua Ammonia
- Sodium Fluoride
- Tetrasodium Pyrophosphate (Anhydrous)
- Sodium Bisulfite (Anhydrous)
- Nitric Acid
- Sodium Sulfide
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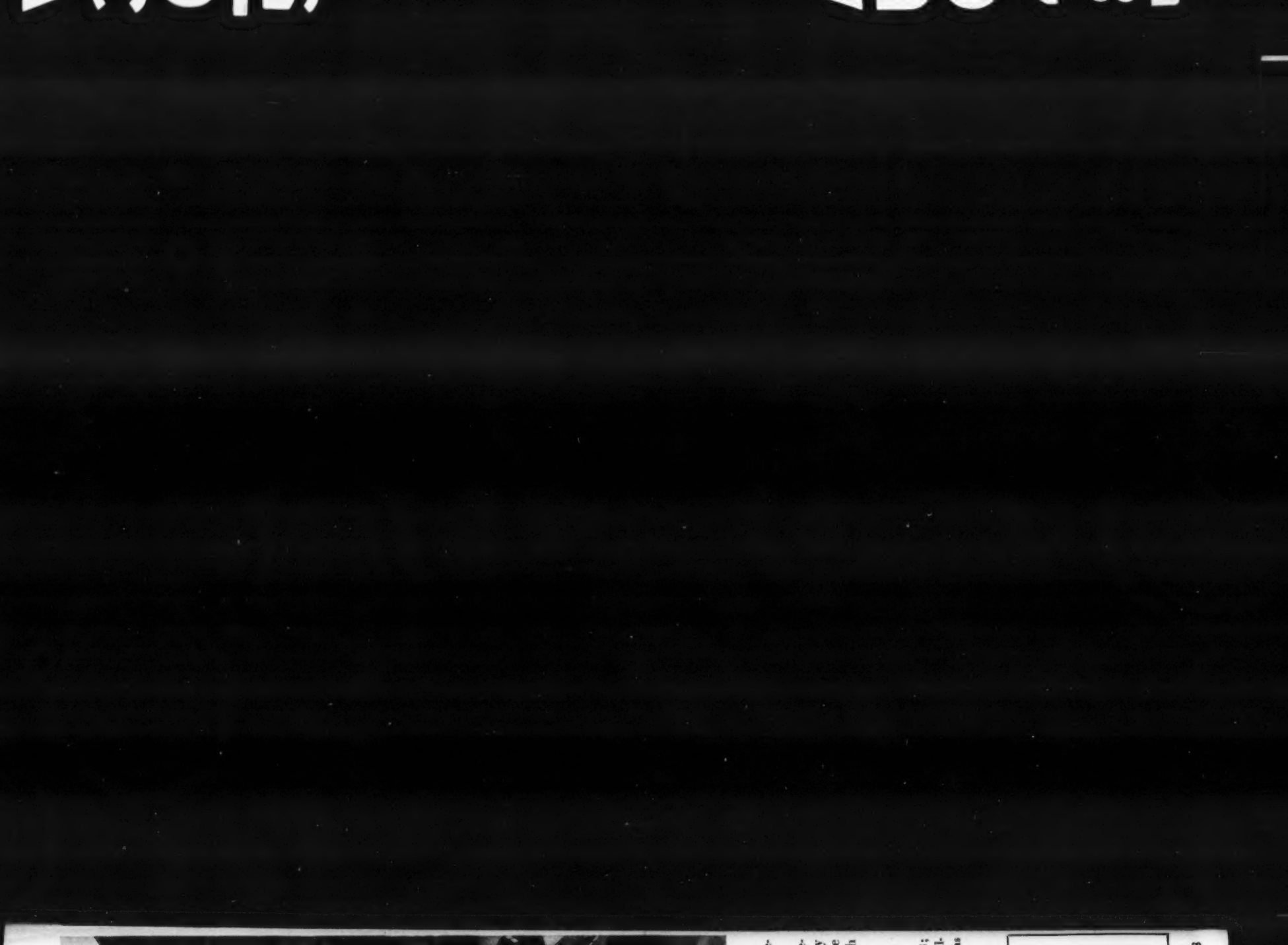
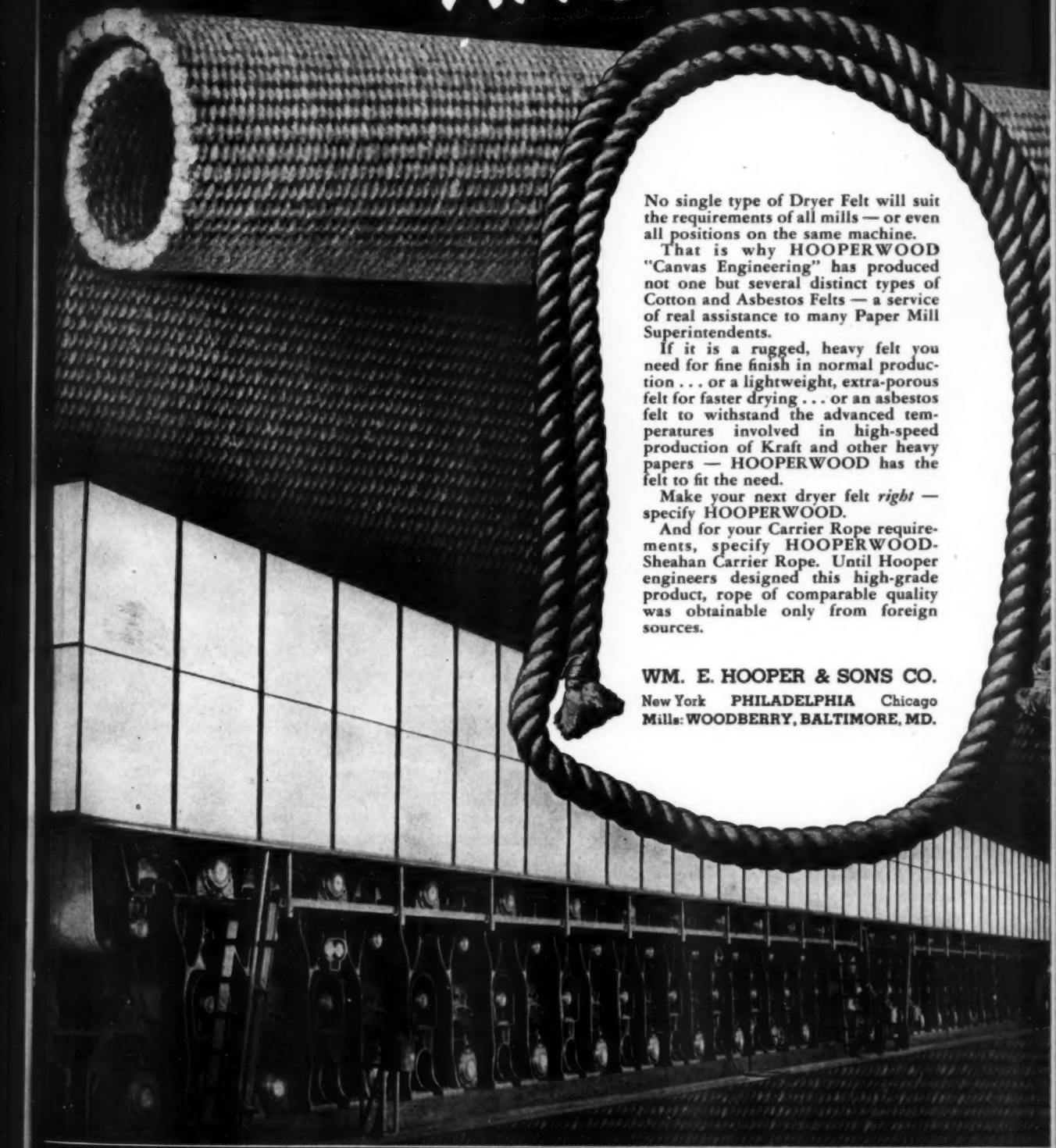


WHAT EVERY PAPER MAKER KNOWS...



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P.S.P. is paying off *today*, for every Security Bond dollar built up in the Treasury retires a dollar of the national debt that is potentially inflationary. Records of the companies that actively maintain the Payroll Savings Plan show improved employee attitudes. Absenteeism and accidents have dropped as the individual's feeling of security grows with regular Bond buying.

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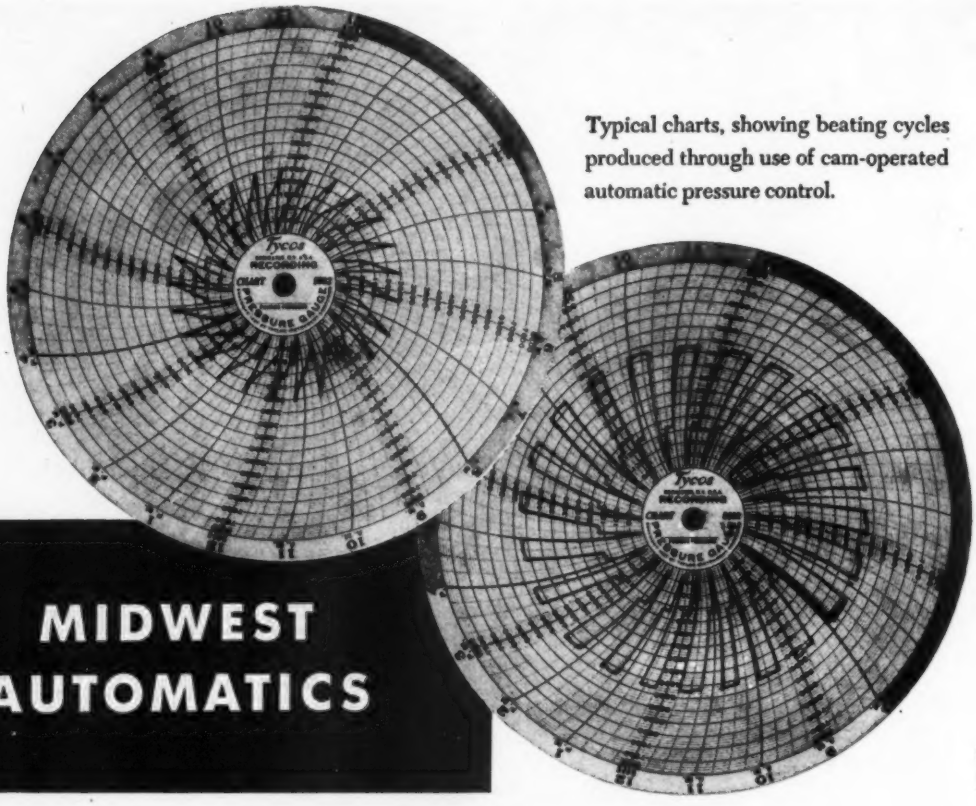

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THE PAPER INDUSTRY
and PAPER WORLD
AUGUST 1948

Import and Export Trade
Of the United States Paper Industry

ERIC G. LAGERLOEF, Secretary, Export Committee
American Paper and Pulp Association

IMPORTS

▸▸▸ THE PATTERN OF our world trade in paper and in its raw materials covers the four corners of the world. Raw materials for our industry have come from 66 countries and manufactured goods from our mills have gone to about 75 countries. This movement of materials for and of our industry in international trade channels is a vital factor in the present rehabilitation of world commerce. Actually, there are few if any other industries which supply as much foreign exchange to world commerce as the paper industry. For example, in 1947, the total value of United States imports of all commodities was $5,810,000,000, of which the U. S. paper industry accounted for approximately $656,681,000 or 11 per cent.

World War II, however, brought an important shift in our sources of supply when European and Far Eastern raw materials were cut off, in most cases completely, for a number of years. In the interim, the industry acquired new suppliers, both domestic and foreign, and also developed substitutes for some materials formerly secured from overseas. There is little doubt that the developments during the war will materially affect the quantities that could be imported had these changes not occurred.

U. S. paper production has expanded enormously since 1937 (some 66 per cent) and uses tremendous quantities of raw materials from overseas, yet the industry is considerably more self-sufficient now than it was back in 1939.

Wood Pulp

Prior to the war, wood pulp, the principal raw material for our paper and paperboard mills, was brought in in large quantities from Europe, primarily Northern Europe. From 1937 through 1939 imports from Europe averaged 1,400,000 tons per annum at an average value of $55,000,000 per year. Imports from Canada and Newfoundland for this same period averaged about 605,000 tons annually, at a value of $28,000,000. Purchases of wood pulp from overseas for our industry were about twice as large as those from Canada and Newfoundland. By the end of 1941, however, manufacturers' mills in this country, principally nonintegrated, had lost their chief overseas suppliers and had to look to domestic and Canadian manufacturers for their needs. For three years not a ton of pulp came from Northern Europe or Europe proper, but in this interim period, Canadian and domestic producers added new manufacturing capacity and pressed into production all existing facilities. In the period from 1939 through 1947, imports of wood pulp from Canada rose from 638,000 tons to 1,531,000 tons.

Since the end of the European war, wood pulp has been moving in ever increasing quantities from overseas, primarily from Sweden, Finland and Norway. By the end of last year, imports from these three countries had amounted to 789,000 tons, about half of what they were in 1937, but valued at almost double what they were in that year. Canada has supplanted much of this overseas demand with her heavy shipments to the United States during the war, and has made such inroads in the imported wood pulp market in this country that it is questionable if European suppliers will ever attain their

UNITED STATES IMPORTS BY QUANTITY AND VALUE, 1937, 1946 and 1947

(in 1,000's of short tons and dollars, unless otherwise designated)

	North America		Other(a) Americas		Northern Europe		Continental Europe		Africa		Near East		Asia		Australia		Total	
	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V
RAW MATERIALS																		
Pulpwood (b)																		
1937	1,378	10,941	e	f	-	-	-	-	-	-	-	-	-	-	-	-	1,378	10,941
1946	1,728	25,214	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,728	25,214
1947(d)	1,830	30,507	-	-	-	-	-	-	-	-	-	-	-	-	e	f	1,830	30,507
Wood Pulp																		
1937	712	33,034	e	f	1,519	58,586	163	6,678	-	-	-	-	-	-	-	-	2,395	98,298
1946	1,235	97,004	e	f	560	38,312	-	-	-	-	-	-	-	-	-	-	1,795	135,316
1947(d)	1,531	160,256	7	929	789	95,750	5	459	-	-	-	-	-	-	-	-	2,332	257,394
Other(c) Fibrous Materials																		
1937	18	477	7	227	e	25	83	4,519	22	545	e	22	49	1,343	e	3	180	7,161
1946	33	1,581	6	872	-	-	13	1,117	6	279	2	150	6	520	e	1	66	4,520
1947(d)	43	2,955	3	373	e	9	14	1,077	4	235	e	22	9	1,000	-	-	73	5,671
FINISHED PRODUCTS																		
Paper																		
1937	3,036	114,365	e	30	300	9,839	26	6,462	-	-	e	f	e	534	e	f	3,364	131,230
1946	3,560	246,800	e	f	20	1,528	1	690	-	-	-	-	e	27	-	-	3,581	249,047
1947(d)	3,904	337,372	e	52	137	15,123	16	3,395	-	-	e	f	e	125	-	-	4,057	356,067
Paperboard																		
1937	16	658	-	-	17	788	4	212	-	-	-	-	-	-	-	-	37	1,658
1946	37	2,308	e	f	4	394	e	3	-	-	-	-	-	-	-	-	41	2,705
1947(d)	46	3,480	e	42	10	816	3	181	-	-	-	-	-	-	-	-	59	4,519
Paper Products																		
1937	3	207	e	3	e	55	5	2,867	e	f	e	f	3	1,047	e	1	12	4,181
1946	2	553	e	25	e	58	2	1,164	e	f	e	f	e	76	e	2	4	1,879
1947(d)	2	876	e	8	e	85	2	1,373	e	f	e	10	e	170	e	f	5	2,523

(a) Includes Mexico
(b) In cords of 128 cubic feet
(c) Includes rags, bags, grasses, waste paper, hemp and jute fibers
(d) Preliminary
(e) Less than 1000 tons
(f) Less than 1000 dollars

Note: Figures do not necessarily add to totals because of rounding

Source: American Paper and Pulp Association, based on Bureau of the Census Report FT 110

former status. The three northern European countries will not be able to match their prewar status for some time anyway, because of raw material shortages, war devastation in Finland and Norway and the loss of considerable production facilities in Finland in areas ceded to Russia.

Pulpwood

The second most important raw material imported for the pulp and paper industry is pulpwood. Historically, Canada has been the foremost source of supply, and imports from Canada have been climbing steadily in the past years. Some shipments have been coming in from Russia at infrequent intervals over the years, but they have been of minor importance.

Pulpwood imports from Canada are an absolute necessity for many pulp producing mills in the New England and Lake States areas and any dimunition in supplies from across the border would have immediate, serious repercussions to domestic consumer mills. The importance of this supply can be pointed up in the volume of imports. In 1946, we imported over 1,720,000 cords of pulpwood from Canada valued at about $25,200,000. In 1947, imports rose to 1,830,000 cords valued at $30,500,000. Due to increased consumer mill capacity in this country, pulpwood imports are continuing to increase and may possibly reach 2,000,000 cords this year.

Other Fibrous Materials

The third category of raw material for the pulp and paper industry in order of import value is rags, bags, grasses, hemp and jute fibers. Continental Europe and Asia supplied about 82 per cent of these products before the war, while only 10 per cent came from Canada and the Other Americas. The war shifted these sources of supply to other areas, and Europe and Asia are only now again beginning to send in any large quantities of these goods. Asia is exporting to us about 75 per cent of her prewar quantities, with India sending the main portion, supplanting Japan entirely.

Canada has now moved up into the position of being the main supplier for many of these materials, and imports in 1947 were almost three times those of ten years ago. Prior to the war, Canada supplied about 10 per cent of the total import value of these goods, but last year, Canada was the source for about 59 per cent of the total import value.

Chemicals

Besides the fibrous raw materials which the industry imports in very large quantities, chemicals, clays, casein, and fillers also play an important role in the general trade picture. It is almost impossible to determine the exact quantities of these imports which are utilized in papermaking, but a reasonable estimate would place the import value of these goods at about $10,000,000 per annum. The most important commodity of this group is casein, imported principally from Argentina. Over the past ten years, imports for the industry have averaged about 10,000 tons per annum, valued at about $3,500.000. Last year, imports for consumption by the paper industry were about 10,000 tons, valued at $5,500,000. Imports of casein fluctuate a great deal, depending upon production, government action and prices both at home and in Argentina.

China clay was and still is imported principally from Europe, with the United Kingdom as the largest exporter. Europe has retained its prewar status as a supplier, and estimated imports for

the paper industry for last year were approximately 7,400 tons, valued at $133,000.

Java supplied about 92 per cent of the United States' needs of tapioca prior to the war, and resumption of this trade was seriously impeded after Japan's defeat due to the Dutch-Indonesian difficulties. The paper and paperboard industries were large users of tapioca before the war, but when supplies were cut off due to Far-Eastern hostilities, the industry reverted to domestic substitutes, South American suppliers, or discontinued using these types of fillers for their furnish. From 1937 through 1942, total imports of tapioca from the Far East were about 619,000 tons, valued at about $22,852,000 of which the paper and board industry accounted for an estimated 10 per cent. Total imports for 1946 and 1947 amounted to only about 1,700 tons. Here again, the shift in supply sources is evident, for South America (principally Brazil) supplied only about 63,000 tons in this earlier six year period, but from 1943 on through 1947, 262,800 tons were shipped to the United States, with the industry taking the same proportionate amount, approximately 10 per cent.

Paper and Paperboard Imports

Aside from the sizable quantity of raw materials which are imported for the manufacture of wood pulp and paper, paper, paperboard and paper products are in themselves major items of international trade. The value of imports of paper, paperboard and paper products averaged $125,000,000 for the 1937-1939 period and $258,000,000 for 1945-1947. Newsprint provided the major portion of this dollar exchange, some 97 per cent, with Canada shipping larger quantities of newsprint here than before the war.

The cigarette paper imports from abroad before the war averaged about $4,000,000 for 1937, 1938 and 1939, but after the cessation of hostilities, they averaged about $12,000 per annum for 1945-1947. Here again the development of a sizable United States industry has made it almost wholly unnecessary to seek foreign sources for this essential high grade paper. Prior to 1942, cigarette paper exports were not shown separately in the official export statistics of the U. S. Government. From 1942 through 1947, cigarette paper exports averaged 9,230 tons annually, at an average value of $8,729,000. The highest export year was 1946, when 15,122 tons were exported at a value of $15,050,419.

Paperboard and paper products imports provided about 2 per cent of the value of imports for both these periods.

EXPORTS

Because of the war and its long-term after effects, the trend of state socialism both in foreign and domestic commerce has been accelerated, placing severe restrictions on the normal flow of goods in international trade. The paramount question today is whether socialism and state trading with its bilateralism, import and export quotas, exchange controls, cartels, subsidies, discriminations and restrictions will gain the upper hand over free enterprise and the preservation of democratic principles. The predominant fear is that world rehabilitation may take so long that state socialism and big government with its stifling influence on democracy may win out. A very strong counteroffensive against this trend is now under way with the Marshall Plan in effect, plus the aid programs to China, Greece and Turkey. All this economic assistance to strengthen the world bulwarks against the aggressions of large predatory nations will result

UNITED STATES EXPORTS BY QUANTITY AND VALUE, 1937, 1946 and 1947

(in 1,000's of short tons and dollars, unless otherwise designated)

	North America		Other(a) Americas		Northern Europe		Continental Europe		Africa		Near East		Asia		Australia		Total	
	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V
RAW MATERIALS																		
Pulpwood (b)																		
1937	24	149	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	149
1946	54	722	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54	722
1947(d)	79	1,331	-	-	-	-	-	-	-	-	-	-	-	-	-	-	79	1,331
Wood Pulp																		
1937	24	893	6	357	e	18	66	4,384	-	-	-	-	225	14,811	2	83	323	20,546
1946	9	798	14	1,329	-	-	13	1,258	e	f	-	-	3	226	e	35	39	3,646
1947(d)	28	2,921	29	4,570	-	-	55	8,724	e	45	-	-	6	941	12	1,666	130	18,867
Other (c) Fibrous Materials																		
1937	42	1,164	7	103	e	f	49	1,810	e	7	-	-	88	1,870	e	6	186	4,960
1946	49	1,883	3	202	e	f	1	102	e	19	e	55	32	2,123	e	1	86	4,386
1947(d)	56	2,398	8	420	e	3	21	1,220	e	28	e	41	76	5,485	2	92	163	9,687
FINISHED PRODUCTS																		
Paper																		
1937	11	2,036	46	5,571	1	103	4	1,061	2	251	e	32	27	3,102	3	410	94	12,566
1946	20	5,424	61	16,652	e	181	41	8,634	20	5,422	8	4,438	59	20,086	8	2,163	217	63,000
1947(d)	24	7,231	84	27,156	e	352	14	5,013	13	4,790	5	2,074	56	20,187	17	5,472	214	72,275
Paperboard																		
1937	10	1,010	21	1,551	2	99	23	1,196	8	511	e	35	10	709	8	421	83	5,533
1946	16	2,138	41	4,208	e	38	4	611	16	1,490	e	154	9	1,260	e	66	87	9,965
1947(d)	21	3,141	40	5,877	e	73	25	2,994	22	2,594	3	433	15	1,855	11	2,013	138	18,981
Paper Products																		
1937	11	2,938	18	3,114	e	103	6	1,468	2	420	e	46	7	1,171	1	329	45	9,589
1946	20	7,464	37	13,599	e	396	8	2,476	8	3,228	1	362	13	4,845	1	480	88	32,851
1947(d)	23	9,470	45	20,197	1	716	9	3,304	14	5,249	2	703	21	8,173	6	2,015	122	49,828

(a) Includes Mexico
(b) In cords of 128 cubic feet
(c) Includes rags, bags, grasses, waste paper, hemp and jute fibers (waste paper about 90 per cent of total exports)
(d) Preliminary
(e) Less than 1000 tons
(f) Less than 1000 dollars

Note: Figures do not necessarily add to totals because of rounding

Source: American Paper and Pulp Association, based on Bureau of the Census Report FT 410

in long-range dividends and champion the cause of free enterprise, provided the recipient nations use this aid to speed up their return to normalcy and not to advance the cause of socialism and nationalization of industry.

If it can be said that any good does come out of war, many of the nations far from the scenes of actual hostilities were able, through the exportation of large quantities of their war potential raw materials, to accumulate sizable export balances, with which they have purchased goods abroad to raise their standards of living. The war-stimulated industries in those countries created record employment allowing for further industrialization, a betterment of living conditions and certain beneficial government reforms along scholastic and sanitation lines. In the past, those countries which have achieved a high degree of technical advancement and industrialization have proved to be the best customers for our industries, and will in all likelihood maintain this relationship in the future. As paper is now providing over $650,000,000 a year in foreign exchange both through imports into the United States of raw materials for paper manufacturing and as a finished product, it is also playing a very important part in the rehabilitation of world commerce and industry through exports from this country.

The paper industry proper never has been export minded and mostly has sought business in its own back yard. This is strikingly evident from the record, which shows that over the years, exports have amounted to only about 2 to 2.5 per cent of production. Nevertheless, there are undoubtedly limitless opportunities to establish firm markets which will expand as trade returns to free and more normal trade channels.

New Markets

These new markets have been created through increased industrialization abroad, increasing standards of living, and market voids left through the almost complete elimination of Germany and Japan as suppliers for many years to come. For example, before the war Germany was a very important factor in the world trade of paper and paper products. Her yearly exports for 1934 through 1938 averaged about 450,000 tons a year, in comparison to our exports of 184,000 tons a year average for the same period. In relation to her production for the five-year period just prior to World War II, Germany exported about 14 per cent of her production, in comparison to our exports of 2 to 2.5 per cent; and yet her per capita consumption was about 103 lb. per annum. At present, Germany's pulp and paper industry is almost prostrate. That part of the industry in the Western Zone is running between 10 to 15 per cent of prewar levels, with increasing production expected, but the mills located in the eastern part of Germany are probably faring very badly. Germany's rehabilitation will take many years, and all the pulp and paper she can produce would be urgently needed for her own people, except where exports may be resorted to for foreign exchange purposes.

Japan's pulp and paper industry in many ways suffered the same fate as Germany's in that the industry is now divided because of its location in the Russian and United States areas of control. Her production dropped to almost nothing in the later war years, and in 1946 was running about 15 per cent of the prewar production of 1,450,000 tons. Prewar exports were about 10 to 12 per cent of production.

The elimination of the former exports of these two countries, totaling almost 600,000 tons just prior to the war, has left a very large deficit in the world supply of paper. The present dearth of paper in the world, and the increasing literacy and improved standards of living in many countries provide unlimited opportunities for establishing new markets and expanding those created during the war as well as those already in existence prior to hostilities.

World Production

United States and Canada, inclusive of Newfoundland, produced about 55 per cent of the world's paper and paperboard in 1937; Europe, about 39.5 per cent; and all other countries, 5.5 per cent. By the end of 1947, however, North America was producing 77.5 per cent of the world's total production (estimated at 36,000,000 tons); Europe had declined to 18.5 per cent; and all other countries were producing 4 per cent. This relationship clearly shows that the burden of supplying the world in this transition period to prewar living standards rests upon the producers in this country and in Canada. Newsprint comprises about 78 per cent of Canada's production, and therefore would play the most important role in her paper exports, which exports are still insufficient to meet the heavy world demand. United States production of paper other than newsprint (which is only about one-fifth of Canadian newsprint production) should continue to expand. The war engendered difficulties encountered in promoting foreign markets at this time should diminish over the coming years. The export trade of our industry may then become a very vital factor, both in the foreign trade of the United States and in contributing to the general welfare of the home industry through keeping production at high levels.

Market Information Sources

Questions have been raised from time to time as to where the markets are for our products, what papers are in most demand, and what markets can be developed. Due to the fact that the industry has never actively sought foreign markets, information on these markets has never been given too serious attention. During and after the war, both the Government and trade associations have made a wealth of detailed data available to the industry, information which should enable the industry to follow the progress of increasing world industrialization and to formulate export policies and programs to fit the needs of these new potential markets. In addition, the proposed revision and expansion of the present Schedule B for exports will, if adopted, provide the mills with considerably more meaningful export statistics which, in turn, will serve as a better yardstick to measure exports by grades of paper.

There can be little doubt that lucrative world markets do exist, although their full emergence and development are necessarily contingent upon peace and the orderly flow of world commerce. For example, per capita world paper consumption for 1947, outside of the United States, could be estimated at between 10 and 11 lb., while that for the United States proper was 342.9 lb. last year. No other country in the world has yet attained the high standard of living enjoyed in the United States, and by and large, our high per capita consumption of paper is synonymous with the rewards from a free enterprise system. Our best markets will be in those countries where the people themselves are endeavoring to make life more agreeable, and are making genuine attempts to use our country as an example of what free men can do. The right kind of leadership and constructive legislation will do much to improve conditions in many countries of the world, and once the trend has been fully established in that direction, then markets will be created which should keep our great industrial capacity working at profitable levels. International trade is a two-way street, and our industry supplies sizable amounts of foreign exchange in its purchases of raw materials. In turn, the very large and high quality production of our mills will more than ever make its contribution towards a better world standard of living.

Is This Reciprocity?

WARREN B. BULLOCK, Manager
Import Committee of the American Paper Industry

▶▶▶ THE TWO NATIONAL party conventions have been held—both the Republican and the Democratic platforms contain planks approving "Reciprocity" with other nations in adjustments of duty rates on commodities in international trade.

Between the two planks, however, there is such a wide cleavage that the issue of Reciprocal Trade Agreements will be an outstanding issue in the presidential campaign in November. Upon the outcome of the elections will depend largely the future of American industry as far as industry is affected by international trade.

Inasmuch as the paper industry has been the subject of more radical duty rate reductions than any other American manufacturing industry, a clear understanding of what a reciprocity policy has meant in the past, and what may develop as a result of the fall campaign, is important to manufacturers, employees and consumers alike.

Immediately after the Philadelphia Democratic Convention, a special session of Congress was called by the President. A special session for election year brings back bitter memories to the American paper industry. It was such a session called by President Taft in 1912 which resulted in the placing of standard newsprint on the free list. That action caused the migration of the United States newsprint industry to Canada. When that Reciprocity Act was passed there were 70 newsprint mills in this country—today only three United States companies are making newsprint exclusively for sale. Some others controlled by publishers are making newsprint for their owners and selling a small surplus, but these mills are operated more as a means of guaranteeing the publishers a sure source of supply of a vital raw material than with a view to financial profit.

That was Reciprocity as practiced in 1913—Canada failed to carry out its part of its diplomatic pledge to grant reciprocal tariff favors.

In 1934, the Roosevelt Administration initiated the present form of Reciprocal Trade Agreements — a program admittedly fostered by Democrats of the free trade school to reduce American tariff rates. The law then enacted authorized the President to reduce any existing tariff rates 50 per cent in return for comparable concessions by other countries. A series of agreements followed, with wrapping and printing papers among the major grades of paper on which rates were reduced. The program was barely under way when World War II stopped international trade. Three years ago the Democratic Congress extended the act for three years, but authorized reductions to 50 per cent of the rates in effect Jan. 1, 1945. This permitted a total reduction of 75 per cent from the rates in the 1930 tariff. Some paper grades, as a result of agreements consummated at Geneva in 1947, have suffered this maximum reduction.

In 1946, the national revolt against New Dealism brought a Republican Congress into power. The Administration sought to secure a three-year extension of the Reciprocal Trade Agreement Act expiring in June, 1948, but Congress rebelled. The Republican majority authorized the extension of the act for one year, and placed restrictions on the power of the Administration to make further reductions without regard for injury which might result to domestic industry. The Republican measure as finally passed and signed (with regret) by President Truman provides that duty reductions may only be made after 120 days of investigation by the United States Tariff Commission of the probable effect on United States industry of any change proposed by the administration. The Commission is required to spell out the effects of every proposed reduction and fix a peril point below which it finds that a cut in tariff rates would injure domestic industry. If the President negotiates reductions below this peril point, he is required to file with Congress a statement giving his reasons for his action.

Measures now pending in Congress and kept alive by the President's call of a special session provide means for a scientific revision of United States tariff laws, and to deny the administration autocratic power to make duty rate reductions as it sees fit.

The basic position of the two parties is as follows:

Republican: Restrictions are demanded to prevent injury to domestic industry.

Democratic: Unlimited executive authority to enter into trade agreements is demanded on the plea that such authority is necessary to complement our relations with foreign nations under the Marshall Plan.

In an attempt to present an unprejudiced survey of the Reciprocal Trade Agreement Program certain basic facts cannot be overlooked.

The cleavage between the Republican and Democratic parties on this issue resolves itself into a definition of the word "Reciprocity." There appears to be as much difference between the Republican and the Democratic definition of the word as there is between the United States and Russia in the definition of the word "Democracy."

Reviewing the results of the trade agreements negotiated by this country with some twenty nations in the Geneva conferences, one cannot refrain from asking, "Is This Reciprocity?"

Parenthetically, attention should be called to the fact that the Geneva conferences did not include Sweden and Finland, and that the present law allows further negotiations with these countries for a reduction of duty rates on such basic grades of papers as the various wrappings, already once cut 20

RECIPROCITY IN TWO PARTY PLATFORMS

DEMOCRATIC

We pledge ourselves to restore the reciprocal trade agreements program formulated in 1934 by Secretary of State Cordell Hull and operated successfully for fourteen years—until crippled by the Republican Eightieth Congress. Further, we strongly endorse our country's adherence to the International Trade Organization.

REPUBLICAN

At all times safeguarding our own industry and agriculture, and under efficient administrative procedures for the legitimate consideration of domestic needs, we shall support the system of reciprocal trade and encourage international commerce.

to 30 per cent. There is still opportunity under this law for a further reduction of 50 per cent in the rates of duty on printing papers, though in 1939 a 40 per cent cut in the duty rate resulted in an increase of imports of groundwood printing and book papers from a total of 9,000 tons in 1939 to 75,000 tons in 1948. A total volume of nearly $10,000,000 a year in American manufactures of these printing papers has been diverted to Canada alone.

Statements filed with the Ways and Means Committee of the House of Representatives and with the Finance Committee of the Senate by the American Paper Industry when the present law was under discussion opposed the extension of the Trade Agreement Act in the form demanded by the Administration because under "Reciprocity" as now practiced by those responsible for its operation, the United States gives much and receives little, while other countries receive much and give little.

Under the Most Favored Nations principle, the United States extends to all the world all the benefits of any tariff concessions it makes to any country, limited only by withdrawal of concessions from nations discriminating against the United States. This principle applies not only to all previous trade agreements, but also to those negotiated at Geneva. Prior to World War II, Germany and Japan were debarred from tariff benefits under this policy, and then when Czecho-Slovakia and Austria came under German rule they also ceased to receive these benefits. Germany and Japan, however, being under American Military Government, are automatically classified as most favored nations. Even Russia and its satellites are beneficiaries, though they have granted no reciprocal concessions. As against this generosity of the United States, no other country gives any concessions to countries which do not join the International Trade Organization.

Specific actions affecting paper by various countries in violation of the spirit of the commitments to which they were parties, are summarized below.

Canada—The joint signature of the Canada-United States Agreement was only a few hours old when Canada secured a United States loan of $300,000,000 and immediately clamped an embargo on the importation of practically every paper item on which it had made even slight concessions, as well as on other items not mentioned in the agreement. Canada is enforcing its Anti-Dumping Act by strict automatic application of extra duties on any merchandise imported at any price which it considers to be lower than the ruling price in the United States. The policy of setting an artificial valuation on imported goods from the United States has been abandoned, but anti-dumping duties are still levied by various methods of computing selling prices, such as when there is a difference between United States f.o.b. mill prices and sales with freight allowed.

Paper manufacturing conditions in Canada, more than in any other country, are comparable to those in the United States, particularly in the wages which constitute such an important part of the cost of production. Without selecting Canada, therefore, as an invidious comparison, but simply on the basis of the comparability of the industry in the two nations, it is illuminating to list the relative tariff rates on the two countries.

In the Geneva Agreements, Canada made concessions on paper to a maximum of 2½ per cent, except on handmade papers, not produced in this country. The United States cut many of its rates in half.

The accompanying table showing the rates of duty levied by the United States and Canada on the major grades of paper is illuminating. Only in the case of wrapping paper, other than kraft, are Canadian duties lower than those of the United States and that difference is only 2½ per cent. The United States rates are computed at the rates of duty effective Jan. 1, 1948, on actual imports in 1947.

A special provision of Canadian law imposes a 25 per cent excise tax on articles, including paper, made in Canada from imported materials or parts.

Mexico—In 1942 the United States and Mexico entered into a joint agreement for mutual reduction of duties. In December, 1947, Mexico unilaterally cancelled all the concessions it had made in this agreement, and in addition increased its duty rates on nearly all other commodities, the average increase being about 30 per cent. The United States Administration held hearings last February at which American exporters were allowed to argue for restoration of the agreement rates, and reductions of nonagreement items, but domestic manufacturers were denied the opportunity to ask for a cancellation of concessions made to Mexico. Mexico's justification for this action was its economic position and the agreement was cancelled by utilizing the escape clause in the 1942 agreement. Incidentally, the plea of economic troubles is now being used by all nations as justification for their failure to carry through their Geneva pledges.

United Kingdom—Britain made no tariff concessions on paper at Geneva, though she was the direct beneficiary of over twenty-five United States rate reductions on paper. The United Kingdom secured a loan of several billion dollars from the United States, then placed either a low import quota or an outright embargo on all American papers.

France—Before France entered the Geneva conference, it changed its basis of computing duties, with the broad effect of materially increasing its former rates. The reciprocal negotiations were then based on an inflated French tariff schedule, on which "concessions" were granted sufficient to bring the concession rates to approximately those previously in effect.

Netherlands—An embargo has been put into effect on various imports from dollar countries.

Brazil—Because of currency problems, Brazil increased its over-all duty rates about 40 per cent before beginning negotiations for reductions.

Australia—After receiving concessions on its principal exports to the United States, Australia placed a practical embargo on imports from "dollar countries," principally the United States.

Argentina—Orders have been issued

Grade	United States Rate (per cent) (Equivalent ad valorem)	Canadian Rates (per cent)
Uncoated printing	8.75 to 10	22½
Standard newsprint, valued		
at not over 2½c	(Free)	12½
Same valued at over 2½c	(Free)	22½
Plain Paperboards	10	22½
Processed Paperboards	7.5	25
Tissue	16.7	22½
Writing	15 to 18.5	22½
Kraft Wrapping	20	22½
Other Wrapping	25	22½
Hanging Raw Stock	7.5	22½

that all export and import trade shall be limited to shipments in ships under the Argentine flag, to the maximum extent to which such shipping is available. Duty rates in Argentina, with which the United States has had a trade agreement for several years, are of little consequence inasmuch as duty is computed on arbitrary values fixed by the Argentine authorities, without regard for actual selling prices, or customary values in the countries of origin. Surcharges up to 20 per cent are authorized in some cases and importers may not remit abroad for their purchases for five years.

Miscellaneous—Without specifying individual countries, there is a general tendency to restrict imports from the United States, as well as other countries, by various administrative measures. These steps violate the original purpose of the Geneva conference to reduce tariff barriers. Much of the difficulty in trade with other nations is the apparent lack of dollar exchange, due in chief measure to the manner in which other nations have depreciated their currency until the dollar is almost the world's only hard money. While no specific instance can be mentioned, it has been found that sterling bloc nations have been inclined to give such preference to other nations in that bloc as to practically exclude our merchandise. British crown colonies have placed import restrictions on goods from dollar countries. Import licenses in the Netherlands have been so restricted that United States paper is practically excluded, to the advantage of Sweden, Norway, Finland, Czecho-Slovakia, Poland and Austria. The import license system of India has operated to almost exclude American papers, while price limitations have permitted imports from low-wage European countries. Many restrictions are applied against products of other industries, but the instances cited are those in which United States manufacturers of paper have come into individual conflict with foreign restrictive measures.

In view of the above incontrovertable data it may again well be asked,

"Is This Reciprocity?"

"l'ATIP"---the Technical Association of the French Paper Industry

LOUIS ELSBERG WISE
The Institute of Paper Chemistry

▶▶▶ THE YEAR 1947 marked a renaissance in the French paper industry. It witnessed the inception of l'A.T.I.P. (l'Association Technique de l'Industrie Papetière), the newly formed technical association. Since then, the association has been publishing a bulletin quite regularly, giving not only the papers presented at the meetings, but details of their spirited discussions as well. It appears to be a live group, reflecting the resilience, independence of thought, and the rugged individualism of the French technologists.

The president of the Association was (and is) M. Paul Germain, and there are two vice presidents, Messrs. Georges Franck and Henri le Menestrel. The secretary is Pierre Delcroix, and the ATIP offices are located at 154 Boulevard Haussmann, Paris (8). In miniature, it resembles our own progressive TAPPI, although it operates on a far more modest scale.

As stated in its first Bulletin (issued in March, 1947), the goal of l'ATIP is to aid in the technical developments of the industry by the co-operative efforts of its various members; to hold its meetings in an atmosphere of mutual trust and esteem, and to encourage fruitful discussion and to permit the exchange of opinions and varying points of view. The bulletins were designed to bring to the membership a complete account of each meeting. Furthermore, they were to be made available to non-members as well. On the other hand membership in ATIP would have the following unique advantages: (a) a documentary service (one of activities of which would be the publication of monthly pamphlets), (b) a translation service, and (c) a technical consultation service. How fully these aims have been realized, the writer has no way of knowing, but he is well aware that ATIP is functioning actively.

The first meeting of the new society was held on January 23, 1947. It began auspiciously. The president and secretary (*pro temp.*, but later made permanent) gave reports and formulated the objectives of the organization, and Pierre Delcroix read a brief but stimulating paper on the Beating Problem, in which the speaker discounted and showed the inadequacies of the usual theories of hydration, and then advanced one of his own. Among other statements made by M. Delcroix was that the old cliché that "paper is made in the beater" would have to be revised. "Paper," said Delcroix, "may be ruined in the beater!"

It soon became evident that beater problem in France furnished live topics because at subsequent meetings of A.T.I.P. the same technologist (Delcroix) discussed beaters, Pierre Avot compared American with European beating practices and R. Renaud gave a comprehensive paper showing that hydration in the beater could be followed more successfully by centrifugation than by the Schopper-Riegler test. L. Grand discussed beater operation and its effect on pulp; the last-named paper was an extensive one, well illustrated by means of diagrams and supplemented by a mathematical treatment. Another paper (presented at Grenoble, at the School of Papermaking) described fifteen years of improvements in the Thorsen beaters installed at the Vizille Paper Mills. At this same Grenoble meeting of l'A.T.I.P., Professor Chiaverina told of a visit to the J. B. Green-Hayle Mill, which produced hand-made paper in Maidstone Kent, England. There was also a report on grinding coniferous woods grown in the Black Forest in Germany,

and the experiences of various French mills (not designated by name) with these raw materials and with varied grinding equipment.

That the papers presented before l'A.T.I.P. were not limited to French technical experts was evidenced by the fact that such noted British technologists as Leslie G. Cottrall and Julius Grant took part in the general annual meeting held in June, 1947. Mr. Cottrall spoke on wet-strength papers and Dr. Grant discussed new viewpoints regarding the treatment of the waste liquors of the industry. Both of these gave excellent presentations, and it was evident the French applied scientists were deeply touched by the collaboration of their British colleagues. Another British paper of marked interest was that of Mr. Heyes on the modernization of the paper machine.

Whereas there is no need of giving a complete list of all papers read before A.T.I.P. in 1947 and in the spring of 1948, several of them deserve passing mention. For example, Professor Jean Chiaverina discussed the changes taking place in the cell walls of fibers when beaten. Mr. L. Remess outlined the factors dominant in the drying of paper. Mr. R. Renaud showed some very interesting electron-photo-micrographs of pulps beaten to various degrees Schopper-Riegler. Mr. Pierre Goldsmid (one of the outstanding paper technologists in France) discussed electrical charges in paper, and their possible elimination.

Several analytical studies were also undertaken. For example, the alpha-cellulose determination in pulps was subjected to critical scrutiny, and the various methods for determining copper numbers of pulps were studied. A start, at least, was made in studying the coefficient of friction of papers—but this has not been carried very far as yet. Professor Chêne (of the University of Grenoble) gave comprehensive data on the properties of paper at two different *p*H's, showing the deleterious influence of acidity in the beater. Louis Widerkehr (returning to France from Switzerland) displayed some beautiful (greatly enlarged) photomicrographs showing the internal structure of various beaten fibers. Corrosion and its prevention in the paper industry was discussed by J. Lasneret.

In many cases, the discussions were spirited, and the questions asked were trenchant and highly pertinent. As time goes on, the Technical Developments Department of THE PAPER INDUSTRY AND PAPER WORLD will bring to its readers a number of detailed abstracts of papers presented before l'A.T.I.P., because these will serve to exemplify the revivification of an industry shell-shocked and damaged by World War II.

Over twenty-two years ago, the author had occasion to visit the famous French Papermaking School at Grenoble; fortunately this great center of technology is still intact, as is its talented staff, which, we trust, will continue to make its contributions for many years to come and which should serve as one of the important nucleii of l'A.T.I.P.

Judging from the first bulletin issued in 1948, A.T.I.P. appears to be a going concern. Late in 1947, its membership was nearly 350, and included therein were 65 forms representing over 50 per cent of the pulp and paper made in France. The individual enthusiasm and loyalty of the present members should insure its growth. One of the functions which l'A.T.I.P. hopes to take over in the near future is that of developing standard methods for paper. Formerly this was in the hands of the *Bureau de Normalization du Papier*, which did some excellent work in the past, but which is nearly dormant at present. Evidently l'A.T.I.P. wants to rewaken the French industry. To the author, who has read most of their technical papers and who has abstracted not a few of these, the objectives of the Association will be reached. Their efforts will be watched sympathetically and with interest by the paper technologists of the United States.

Level Control Solves Pumping Problem at Badger Mills

S. H. JONES
Chicago District Manager
Askania Regulator Company

▶▶▶ THE PAPER AND PULP mills of the Badger Paper Mills, Inc., Peshtigo, Wisconsin, straddle the Peshtigo River with the pulp mill on one side, the paper mill on the other. The result of this location is that the 75 tons of bleached sulphite pulp used in the mill each day must be pumped across the river.

For some time, difficulty had been experienced in regulating the rate of pulp flow with rate of production. The pulp tank was pulled dry spasmodical-

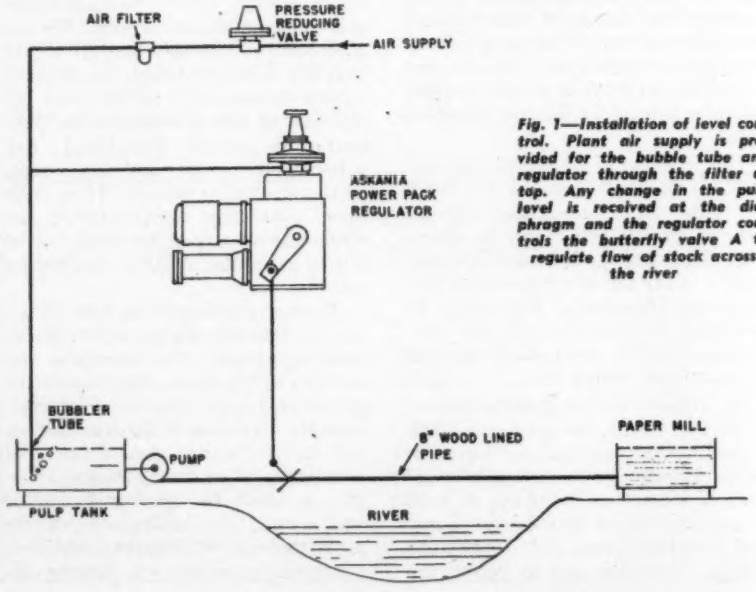


Fig. 1—Installation of level control. Plant air supply is provided for the bubble tube and regulator through the filter at top. Any change in the pulp level is received at the diaphragm and the regulator controls the butterfly valve A to regulate flow of stock across the river

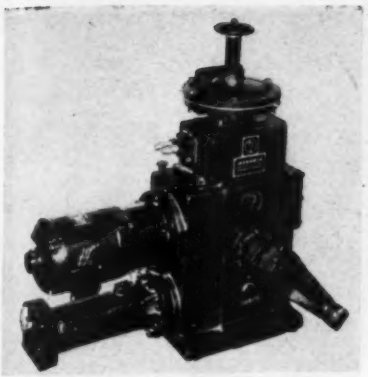


Fig. 2—Askania Power Pack Regulator, which made possible level control at Badger Mills. The Regulator is a self-contained, completely packaged unit, operating with a jet pipe relay supplied with oil under pressure. It was mounted on the washer chest

ly, causing the centrifugal pump to become airbound. The airbound pump would allow the pulp tank to be filled to overflowing, wasting a good deal of stock to the sewer.

The mill was losing stock by overflow to the sewer at both ends of the line, in addition to being troubled with large kilowatt demand changes for operating the pump, with fluctuations in system voltage resulting.

In seeking a solution for this problem, Mr. J. A. Hanson, general superintendent of the mill, ruled out flow control, since there was no means for controlling the volume of stock to be handled. He decided to use level control, using a standard Askania Power Pack Regulator.

The Askania Power Pack Regulator (Figure 1) which is mounted on the washer chest is a self-contained, completely packaged unit. The jet pipe relay of the regulator is supplied with oil under pressure to operate the butterfly control valve in the stock line. The position of the jet pipe is established by the bubbler tube impulse from the stock chest. The sensitivity of the regulator will permit level control with an accuracy of ±.01" W.C. although in this case, it is adjusted to maintain ±.1" W.C.

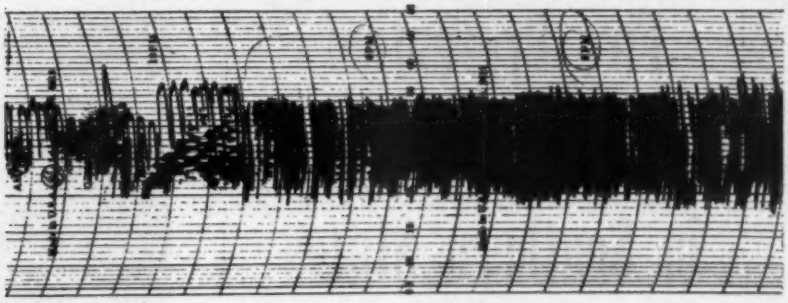


Fig. 3 ("Before" chart)—Fluctuations in kilowatt demand for operating the pump are shown on this record taken from the voltage recorder on the stock pump motor

The Power Pack Regulator was installed in conjunction with the bubbler tube as shown in Figure 2. The plant air supply, provided with an air filter, passes through an air pressure reducing valve to a needle valve. The needle valve is adjusted to establish a small air flow to the bubbler tube. The amount of air flow is adjusted by a small sight gage. The back pressure from the bubbler tube is then applied to the diaphragm of the regulator. When a change of pressure has been received by the diaphragm, the regulator opens or closes the valve in the pipe leading across the river to maintain a constant level of stock in the pulp tank.

After its installation in May, the level control fully justified its application to the problem. As the charts (Figures 3 and 4) from the recording ammeter on the stock pump motor show, variation in power supplied to the pump virtually ceased. The control did an excellent job of smoothing out delivery of stock from the pulp mill to the paper mill.

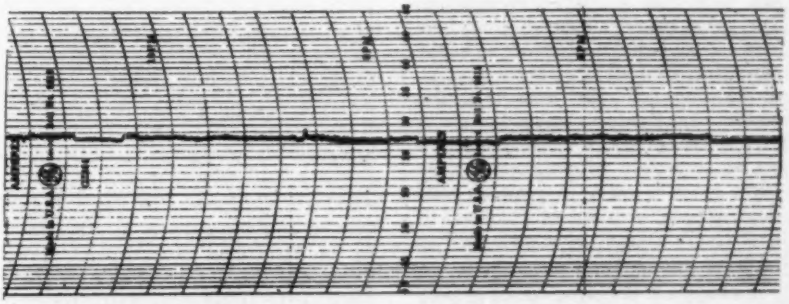


Fig. 4 ("After" chart)—A record from the recording ammeter taken during the same time period after installation of level control. The time period shown, during the evening hours, is one when requirements for a constant voltage for lighting would be greatest. The demand of the pump motor has been greatly reduced by level control, as shown by the chart.

Three concrete results, then, have come as a result of the application of level control to this pumping problem: (1) The stock pump no longer floods the washer chest; (2) Flooding of the paper mill stock chest was eliminated—variations in paper mill stock chest had caused flooding of paper mill washers, plugging, waste; and (3) Overloading of the stock pump motor was prevented.

▶▶▶ IT IS NO COINCIDENCE that our high standard of living and the expansion of American industry have been simultaneous with the development of research. American industry today enjoys an enviable position because it has learned the true value of new knowledge and the use of the laboratory. Research has served industry, and industry serves mankind. It was not the research laboratory which won the war—it was the industrial application of research results translated by industry into equipment, apparatus and devices.

—J. E. HOBSON

Fire Prevention on Pulpwood Logging in Southern States

When smoking in the woods, scrape away pine needles or trash, extinguishing cigarette firmly in mineral soil

A. W. NELSON, JR., Chief Forester
The Flintkote Company (Meridian, Miss.)

▶▶▶ THE PROBLEM of pulpwood supply is one which is receiving more and more attention by the management of the pulp and paper industry in this country. The movement of mills southward, which began in 1930, was a significant trend inasmuch as it opened up vast supplies of pulpwood which had heretofore not been considered. The mill capacities have continued to increase, and the number of mills has more than doubled since the early days of the pulp and paper industry in the South. Far-sighted management is aware that in order to guarantee an abundant supply of pulpwood every effort must be made to grow an adequate supply, both on company-owned lands and on lands of others; such as farmers, lumber companies, etc.

Fortunately, the rapid rate of growth in the South makes it possible to produce crops of pulpwood as early as ten years after planting. This is especially true of slash pine. This rapid rate of growth also makes it possible to cut in a tract of timber from every eight to ten years in order to remove the accumulated growth. Where this cutting is regulated to remove not more than the annual growth, and where there is enough land to log continuously under this system, a continuous or sustained yield is effected. This type of forest management is the goal of all pulp and paper mills which own lands, and also all the large lumber companies. Smaller owners, on the other hand, not owning large enough tracts of land to log in them every year may remove their accumulated growth at smaller intervals, depending upon the status of their other incomes.

Complete Fire Control Is Necessary

Since pulpwood in the South comes from relatively young trees, the effect of forest fires on the pulpwood supply is more keenly felt than on any other type of forest product. This does not mean that forest fires are not a major concern to all forest industries, but it does mean that the pulp and paper industry is relatively more affected by fires than are other large industries. In the South, the average ground fire will not destroy a tree six inches or larger at the stump. It does destroy, however, all of the smaller seedlings and saplings which will grow to pulpwood size within very few years. Lumbermen and the growers of other forest products also must depend upon these small trees to grow and take the place of the larger trees which are cut. Since, from a practical standpoint, all classes of forest products are grown and sold from practically every forest in the South, fire control then becomes everybody's business; and a loss by fire is a loss not only to the individual landowner, but to the community as a whole. The prevention of fires on pulpwood logging operations, therefore, is as necessary as is the prevention of fires in a manufacturing plant. The forest is, in a sense, a manufacturing plant in itself, since it is an area devoted to the chemical synthesis of sunshine, water and certain minerals for the production of wood. When the forest is looked at in this fashion, it is easy to see that we can no longer tolerate woods fires as they have been tolerated in the past.

Methods of Producing Pulpwood in the South

Before an analysis and recommendation for the prevention of forest fires in the South can be made, it is necessary first to examine the methods used in production of pulpwood, since the problem of fire prevention will vary with each class of operation.

The Independent Contractor

The independent pulpwood contractor is by far the largest producer of pulpwood in the Southern States. Each mill arranges to purchase wood from a dealer in a given area. Most mills have several dealers, the exact number depending upon the area from which a mill purchases its wood supply. These dealers, in turn, arrange to buy wood from sub-contractors or producers. These producers are actually engaged in the cutting and the hauling of pulpwood. They usually arrange to purchase their own timber, cut it, and haul it either to the railroad or to the mill yard at a rate determined for them by the dealer. This type of independent contractor logs not only outside lands, but, in many cases, cuts pulpwood under a contract on forest lands owned by the various pulp and paper companies.

The Company Operation

The company operation usually consists of a foreman and a crew of men, all of whom are on the payroll of the plant consuming the wood, and who are usually paid on the hourly-rate basis the same as regular mill employees. This company operation is usually confined to the cutting of company-owned timber, although in certain cases tracts of stumpage are purchased from other owners for cutting by the company crew. Generally speaking, company-owned crews are more mechanized and have better supervision than do crews operated by independent contractors. In practically all cases, company crews are engaged in selective cutting operations, whereas many of the operations of the independent contractor may be on a clear cutting basis, according to the desire of the landowner who is selling the timber.

The Problem of Eliminating Fires

There is an old saying among forest rangers that the best kind of fire to have is the fire that was prevented before it starts. This refers, of course, to a potential forest fire hazard which either through education or through some positive action was removed, and the fire that it probably would have started has been prevented. Fortunately, approximately 96 per cent of the fires in southern timberlands are man-caused and are, therefore, subject to elimination. Fires from lightning and other causes over which man has no control are very few and for all practical purposes can be disregarded from the standpoint of the pamphlet. The prevention of fires is more than just the saving of property which already exists. Statistics compiled by the U. S. Forest Service indicated that fire and other destructive mortality, such as insects, destroyed more timber in the South than was being cut for pulpwood until just about a year ago. The complete elimination of fires, therefore, provides a positive means whereby volume of timber available for pulpwood can be doubled.

The Prevention of Fires on Company Pulpwood Logging Jobs

The company operation will be considered first, since it is usually better organized and better equipped to handle fires than is the independent contractor. The points developed on the company operation will then be discussed and applied to operations of independent contractors.

Fires may be of several kinds: (1) Those which originate on the logging job itself as a result of the actions of one of the members of the crew, or (2) fires which originate on adjacent lands and which threaten the lands on which the company crew is working. Regardless of the cause of the fire, the foreman on the job should be instructed to cease work as soon as a fire is discovered and reported to him and to take his crew and extinguish the fire as quickly as possible. Company operated pulpwood logging crews usually function under the direction of the Forestry Department or the Land and Timber Department, and are practically always used for the suppression of all fires during the fire season. This arrangement not only provides for an effective, trained fire crew under a foreman who is available at all times, but, also, eliminates a crew of men having to sit around doing nothing while waiting for a fire to develop. The company forestry departments are rapidly being equipped with two way radio, which allows information regarding a fire to be flashed immediately to the foreman on the logging job and thus no time is lost in starting his crew to the fire.

Tools and Previous Training Necessary

The fire season in the Southern States usually extends from September through May. Before the fire season actually starts, the supervisor in charge of the woods should see to it that the various foremen of these company jobs are given adequate training and background instructions as to the part that they will play in the prevention and extinguishment of fires during the fire season. Each foreman should have as a part of his equipment the following items:

1) Adequate first aid kit or kits

2) A map of all of the company holdings, together with all the roads in the area in which he is operating

3) A complete set of fire tools (preferably these should be kept in a separate box and sealed with a freight car seal. This insures the tools being in place when needed and prevents their use for other purposes)

If the foreman is not an experienced firefighter, he should be assisted on the first few fires by the supervisor and, if possible, he should be sent to one of the forest fire training schools which are held annually by the various State Forest Services in the South. (See detailed information under each state in the appendix.)

The foreman should be familiar with every tool that is used in his region to fight fires and he should be able to instruct the men in his crew in their use. The crew should be given instructions, both individually and as a group, before the fire season begins, so that when a fire occurs they will be already organized and the instructions will not have to be done on the fire line.

In addition to properly instructing a school in the methods of fire fighting, the foreman should also issue instructions on smoking and warming fires. The fire conditions in the South are seldom critical enough to warrant the enforcement of a "No Smoking" ban in the woods. Smoking is usually allowed on all jobs at any time; the only safety precaution needed is that of scraping the pinestraw or leaves away so that the match, cigarette or cigar butt can be extinguished in mineral soil. Special caution must be given the crew from time to time regarding the flipping of matches and cigarette butts from the windows of pulpwood trucks or of trucks being used to haul the crew back and forth to work. It has been found that this is a very hard habit to break, and even after being continually cautioned about this, force of habit will make an employee unconsciously break this safety rule. This is one of the most important rules concerning smoking, since roadsides are usually covered with dry, inflammable grass, and the number of roadside fires which are discovered bears out the suspicion that this is an important source of forest fires.

The warming fire is universally used in the wintertime, not only to warm the employees from time to time during the day, but also to cook the noonday meal or warm a pot of coffee. On some operations, as many as six or eight warming fires are built throughout the day. Employees should be cautioned to rake away all inflammable material before starting a fire and to

Pulpwood trucker stops to give location of a forest fire to company foresters in radio-equipped jeep

make sure that the fire is extinguished, preferably with water, before leaving the job at night. It should be the foreman's responsibility to personally check each warming fire that has been started during the day to see that these requirements have been met. Merely to rake around a warming fire that has died down is not enough. Instances are on record of forest fires having been started when a high wind came up and blew sparks from the supposedly "dead" warming fire across the safety trench and started burning in the dry grass and leaves on the other side.

There still exists in the South a certain class of individual who believes it necessary to burn off the woods before beginning a logging operation. He does this for a number of reasons. Some claim that it makes logging easier and less hazardous. Others claim that it drives the snakes out of the woods. Whatever their reason, however, care must be taken to see that this type of individual does not have the opportunity to set fires. This type of person is usually known locally as a "fire bug," and can generally be spotted on the basis of information received from others. A great many people in the South still believe that burning off the woods every spring is good for cattle, and care must be used in order to avoid getting mixed up with someone who wants his woods burned and his pulpwood cut at the same time. If he wishes to burn his own woods, it is best to let him do it himself and to take all responsibility therefor. Fortunately, this type of person is rapidly being converted to the better types of forest practices.

Controlled Burning

Although controlled burning is still a controversial subject, it is well to mention it here, since it does have a place in legitimate forestry operations. Controlled burning is a term used to describe a fire which is purposely set under controlled weather conditions, for the purpose of either sanitation or fuel reduction. Without going into technicalities, it is sufficient to say that it has been found that controlled fire is necessary and desirable when raising certain types of timber (namely, longleaf and slash pine). In longleaf pine, it is found that if a controlled fire is not run through the woods on about three-year intervals, the accumulated fuel will, after a ten-year period, burn so hot in an accidental fire as to kill the entire stand of timber and to be extremely difficult to extinguish. In certain companies operating in the longleaf and slash pine areas, the same company crew may be engaged in controlled burning during the correct time of year and in fighting wild fire during the balance of the time. This is often confusing to the native population; especially since they have been cautioned for many years to keep fire out of the woods. The sight of company crews setting fires in their own woods is almost incredible, and it sometimes gives the excuse for anyone else who wishes to burn the woods to get out and help set fires in areas where they were not intended.

A good public relations program is necessary here to convey information to all local residents who are liable to see or hear of the controlled burning work.

Prevention of Fires on Independent Contractor Jobs

The probability of fires originating on independent contractor jobs is much greater than on company operations, since the degree of supervision is usually less, and there is usually little or no control over the activities of the various cutters and haulers who are usually operating on a sub-contract or a piece-work basis.

One of the most effective means that has been found so far to overcome this is to include in the timber sale contract a provision whereby the contractor agrees to be responsible for any fires which he or any of his sub-contractors may start in the woods, and also to stop his timber cutting operations when requested in order to furnish labor for fighting fires that might threaten elsewhere in the area in which the landowner is interested. The biggest difficulty with this type of proposal is that a great deal of the agreements to purchase pulpwood from various landowners are made orally, and neither the pulpwood contractor nor the landowner thinks anything about fires until they actually occur.

All of the points mentioned during the discussion of the company operations apply even more so to the independent contractor. Instead of the company foresters or foremen instructing their men, what little instructions they do get is usually given by members of the State Forest Service. It is also possible to hold demonstrations for the private contractors, or for one of the company foresters to go out with the independent contractor on his job and give instructions in fire fighting and in the common-sense precautions which will lead to the prevention of fires.

Tool Caches

The average independent contractor has no fire fighting tools whatsoever. In fact, many pulpwood crews have been known to continue pulpwood cutting while a woods fire was burning within several hundred feet of them and expressed no concern whatsoever, except to see that the flames did not char the pulpwood that they had already cut. This is typical of the attitude of some of the sub-contractors. Where pulpwood timber is cut under a written contract wherein the pulpwood contractor agrees to be responsible for the fires on his job and to assist in fighting fire elsewhere when called upon, a box of tools and a box of backpack pumps should be given to the contractor so that he may have them at hand if he is called upon to fight fire with his crew. The box of tools and the rack of backpack pumps should be so fixed as to discourage their use for other purposes than fighting fire. Some pulpwood contractors will balk at having to fool with fire tools or fire fighting at all, but it is found that if the landowner insists his timber will not be cut except by someone who will follow the simple precautions and assist the landowner in fire control during the course of his timber cutting; the contractor usually agrees to this provision.

The personnel of a pulpwood contractor's organization frequently changes from week to week, with the result that they are not a very efficient fire fighting force. As new men come on the job, they must be instructed over and over again in both fire prevention and in the use of tools for the control of fires. Obviously, it will be impossible for either the company purchasing the wood or the landowner to keep this matter of instruction up to date. The responsibility rests with the contractor himself, since he is the one who is employing and directing the sub-contractors under him.

Education of the Pulpwood Contractor

In order that the contractor may properly understand the position of fire in relation to his business, he must be well enough acquainted with it in order to properly instruct his new employees from time to time. Since wood contractors cannot usually leave their jobs for a long enough period to attend the fire fighting schools held by the various State Forest Services, it has been found more effective to hold regional meetings of one day's duration, at which time all of the wood contractors in a given area can be assembled and taught the fundamentals of fire control and of education in the prevention of fires.

The company foresters should assist in this program and should collaborate with the State Forest Service in setting up the program for this type of meeting. This meeting should establish the

following points clearly in the minds of all the wood contractors present.

1) The legal responsibility for allowing fire to escape

2) Who is responsible for the control of fire in the area in which he works?

3) Who to call in case a fire is discovered

4) When and under what conditions will he be called upon to assist in fighting fire?

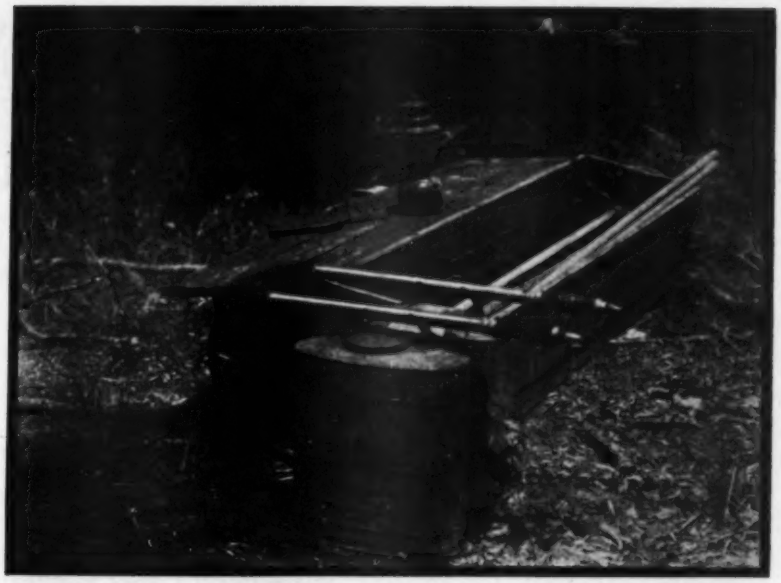
5) His responsibility in instructing his own employees in safe practices in the woods

It will be difficult in many areas to interest the pulpwood contractors, or even to secure their co-operation. Some pulpwood contractors feel that fire control is none of their business. Others feel that the State Forest Service or the private Forestry Departments are being paid to look after fires and, therefore, it is of no concern to them. Still others have been found to be of the opinion that all of the publicity and educational work about the prevention of forest fires was for the benefit of the other man and did not principally concern him. Since the greater portion of pulpwood in the Southern States is cut under the independent contractor system, the greatest reduction in fire damage can be secured by obtaining the co-operation of the independent pulpwood contractors. Since there are as many types of men as there are colors in the rainbow, no set of rules can be given here on the best approach to use for each contractor. That will have to be worked out and governed by the individual circumstances. Probably the biggest factor will be the landowner's refusal to sell pulpwood to a contractor unless he follows or co-operates in some sort of a fire prevention program. Since there is a shortage of pulpwood, the contractors are eager to purchase stumpage and will usually go along with a program of this sort.

Intelligent co-operation between the pulpwood mills and their Forestry departments, the State Forest Service and the timberland owners and pulpwood contractors can solve the problem of fire damage on pulpwood logging operations. The ability to see the other man's point of view, plus an almost fanatical insistence on the following of certain safety rules with regard to fire, will have the effect of eliminating the fire damage which is devastating to the young timber in the South today.

Conclusion

The problem of reducing the damage from fires in the Southern States is one which has received the attention of foresters, landowners, timber operators, and others for over a period of fifty years. There is no quick and immediate solution to this problem. The solution lies in a complete understanding by all parties concerned of their respective responsibilities towards the prevention of fires, and of their responsibility toward the education of those people who are employed in the timber industry to see that their own ignorance does not destroy the natural resource upon which they depend for a livelihood. Pine timber in the South is in short supply, and it is likely that the demand will continue above the supply for a great many years. This fact lends an added incentive to see that wild fires in the South are reduced to an absolute minimum. Merely to have a series of meetings is not enough. Fire prevention must be practiced the only place where it will do any good—in the woods.



Kit of fire tools which should be available on any large pulpwood logging operation. Rakes, flaps, lantern, first-aid kit and snake bite kit fit in box with rope handles. In case of fire, these tools can be quickly placed on the nearest empty wood truck and carried to scene of the fire

Appendix

With the exception of lands located adjacent to and within the boundaries of National Forests, the Forest Services of the various states are the agencies held responsible for forest fire control, and all forest fire control work, whether educational, training, or actual suppression, is usually carried out in co-operaation with the State Forest Services. The Services of each of the Southern States are outlined here, together with the information on person or persons to contact in that state regarding forest fire control assistance, and for educational and training work.

The Forest Service may be contacted either at its Atlanta office (Glenn Building) or through the Forests Supervisor of the National Forests, on or near which operations are expected. Literature and posters on fire prevention may be obtained from the U.S. Forest Service.

Alabama

Forestry in Alabama is administered on a state basis by the Division of Forestry, Department of Conservation, at Montgomery, J. M. Stauffer, state forester. The Alabama Forest Service maintains a field organization engaged in the active suppression and control of fires. All inquiries regarding co-operation should be addressed to the state forester at Montgomery.

Arkansas

Arkansas State Forestry Commission, P.O. Box 194, Little Rock, Arkansas, Fred H. Lang, state forester. The Arkansas State Forestry Commission maintains a staff of field men, rangers, patrolmen, etc., engaged in fire suppression and educational work throughout the state. All information and contacts regarding co-operative work should be addressed to Fred H. Lang, state forester at Little Rock.

Florida

Florida Forest and Park Service, P.O. Box 1200, Tallahassee, Florida. Florida Forest and Park Service is authorized to enter into co-operative forest fire control agreements and co-operative training work. Inquiries should be addressed to the state forester at Tallahassee.

Georgia

The Georgia Department of Forestry, State Division of Conservation, A. R. Shirley, director. The Georgia Department of Forestry is authorized to enter into co-operative agreements for fire protection. They also hold Ranger Schools during the year, at which time private or industrial foresters and others may attend. Address all inquiries regarding co-operative work to A. R. Shirley, director, at Atlanta, Georgia.

Louisiana

Louisiana Division of Forestry, Department of Conservation, Baton Rouge, Louisi-

(Turn to page 741)

Length and Width of Unbleached Sulphate Pulp Fibers from Certain Western Woods

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SUMMARY—Fiber measurements were made at the U. S. Forest Products Laboratory on unbeaten, unbleached, easily bleached sulphate pulps from Douglas Fir, Western hemlock, Pacific silver fir, and Western red cedar woods because of the industrial interest in the possible relation of fiber dimensions to pulp quality. The arithmetic-mean lengths and widths of the whole fibers in these pulps were found to differ somewhat according to species. More marked differences in length distribution were observed.

A comparison of the weighted-average fiber-length values of all fibrous material (i.e., whole fibers, fiber pieces, and ray cells) in the pulps showed them to be essentially the same. As in the case of the length distribution of whole fibers only, the length distribution of all fibrous material in the Douglas fir pulp showed a higher proportion of very long fibers than the other pulps.

▸▸▸ WHEN CONSIDERING the quality of papermaking pulps, the question of the influence of the dimensions of the fibers and fiber fragments and of the frequency distribution of these dimensions usually arises. There are, however, but few published data on dimensions of pulp fibers. The work at the U. S. Forest Products Laboratory reported here is a further, although small, contribution of information on this subject.

The woods represented in this study were Douglas fir, Western hemlock, Pacific silver fir, and Western red cedar. The fiber dimensions were obtained on the unbleached, unbeaten, easily bleached sulphate pulps that are described elsewhere *(3)*. The measurements included the length and width of whole fibers and the lengths, but not the widths, of ray cells and all pieces of fibers 0.02 mm. and longer. The data obtained permit the determination of: (1) the length distribution, the average length, the average width, and the length-width ratio of whole fibers, and (2) the length distribution and the average length of all fibrous material.

Procedures

The method for determining fiber dimensions comprised the preparation of slides for microscopical examination, magnification by projection of an image of the fibers onto a screen, and the measurement of these projected images.

For preparing the slides, a suspension of the pulp was made in distilled water at a fiber concentration of 0.15 ± 0.05 gram per liter. About 0.2 ml. of suspension was deposited on the slide, and the water was removed by drying on a hot plate. The fibers were then stained with safranine A dye, and a cover glass was firmly pressed down over them. The dye solution used was made by diluting a 0.5 per cent alcoholic solution of safranine A with a 50-50 glycerine-water solution to such a point that the fiber images when projected on a screen in a trial test, appeared well-stained but with a nearly white background.

All measurements were made upon projections of the fibers at a magnification of 100. No measurements were made on particles less than 0.02 mm. in length. In measuring whole fibers, both the length and the width were measured on the same fiber. Width measurements reading to within about 0.3 mm. on the magnified image were taken at three equal intervals along the fiber. The three measurements were averaged. First, 100 whole fibers were measured along with all the fiber material such as cut fibers, fiber fragments, and ray cells in the projected area. Then 100 more whole fibers were measured, but with all other material omitted. After each fiber image was measured, it was checked by marking to prevent its duplication or omission of others.

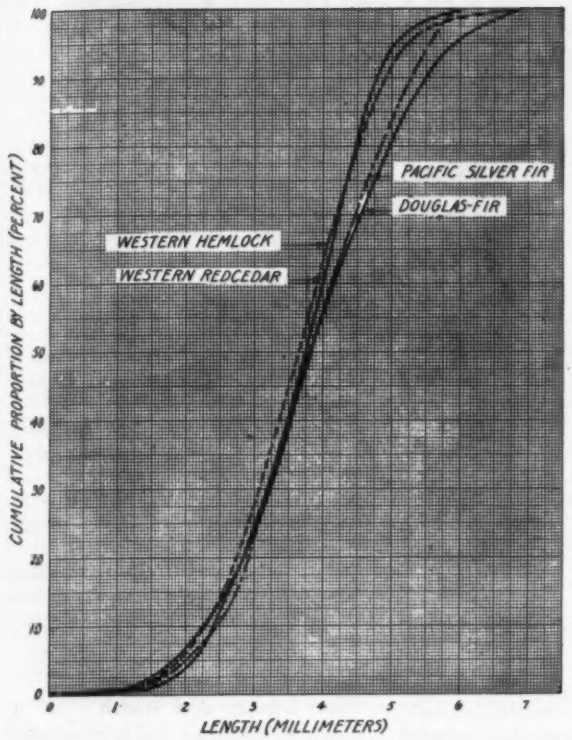
Treatment of Data

Individual length values were classi-

(*) Forest Service, U. S. Department of Agriculture, maintained at Madison 5, Wis., in co-operation with the University of Wisconsin.

TABLE 1—Dimensions of Fiber Material in Sulphate Pulps from Pacific Northwest Woods

	Arithmetic-mean length	Weighted-average length	Arithmetic-mean width	Proportion of whole fibers	
				By number	By length
	Mm.	Mm.	Mm.	Percent	Percent
Douglas-fir, digestion No. 2703					
Whole fibers	3.56	--	0.039	100	100
All fiber material	.84	3.06	--	13.9	59.1
Western hemlock, digestion No. 2691					
Whole fibers	3.38	--	.038	100	100
All fiber material	.88	2.92	--	12.5	48.4
Pacific silver fir, digestion No. 2693					
Whole fibers	3.59	--	.043	100	100
All fiber material	.98	3.26	--	12.4	45.7
Western redcedar, digestion No. 2698					
Whole fibers	3.52	--	.038	100	100
All fiber material	1.45	3.23	--	16.6	40.6



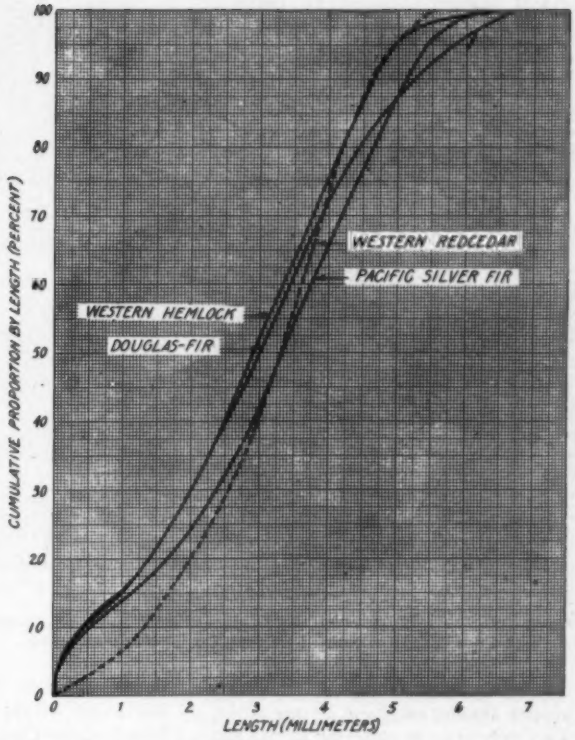


Fig. 1 (left)—Length distribution of whole fibers in unbeaten, unbleached sulphate pulps from four Pacific Northwest woods. . . . Fig. 2 (right)—Length distribution of fibrous material (whole fibers, cut fibers, and ray cells) in unbeaten, unbleached sulphate pulps from four Pacific Northwest woods

fied into groups having a range of 0.2 mm., except the first group, which covered the interval of 0.02 to 0.19 mm., or a range of 0.17 mm. Fiber length was expressed both as the ordinary arithmetic mean and as an average weighted by length as shown in Table 1. The weighted average was calculated by (1) expressing the total length in each class as a percentage of the total length of all fibers measured, (2) multiplying each of these percentages by the average length of the corresponding class, and (3) adding the products and dividing this sum by the sum of the percentages calculated in (1) above, i.e., by 100.

The weighted-average fiber length attributes importance to the various length classes more nearly in proportion to their weight than does the arithmetic mean. It is reasonable to believe that in the case of pulps the weighted average may relate more directly to other pulp properties than does the arithmetic mean. For example, the number of very short pieces of fiber in an unbeaten pulp due to chipping and to breakage and to ray cells is sufficiently large to influence the arithmetic-mean length out of proportion to the possible effect of the weight of this fraction on sheet properties. On the other hand, it is believed that the ordinary arithmetic mean should be used in the case of whole fibers because here it represents a natural occurrence, and, furthermore, the extremes in length distribution are not sufficient to affect the mean disproportionately.

It has been recognized for some time that even a weighted-average fiber-length value is inadequate for comparing fiber length of pulps. Comparison on this basis is justifiable only if the length distribution is the same in the pulps being compared, a circumstance likely to be of rare occurrence. For this reason, distribution curves are presented in this study (Figures 1 and 2) in addition to weighted-average fiber-length values.

Average width of whole fibers was expressed only as the arithmetic mean. Figure 3 shows a curve relating to length and width of whole fibers.

Discussion of Results

Fiber Length

Whole fibers. — Arithmetic-mean length values of whole fibers for the four species studied are given in Table 1. An analysis of variance showed that these values for Douglas fir, Western hemlock, Pacific silver fir, and Western red cedar are not significantly different. Although not directly comparable for several reasons, these values are also shown in Table 2 with values reported by other investigators for these species. It will be noted that the greatest spread of values is in those reported for Douglas fir where the range is from 3.2 to 5.2 mm.

Natural factors known to influence the arithmetic-mean length of wood fibers are growth conditions *(7)*, age of tree *(6)*, and their position in the tree *(7)*. In regard to the mean length of whole fibers in a pulp, there is also the effect of the imposed influence of the cutting of fibers during chipping. As far as is known, this influence has not been evaluated. It is reasonable to suppose, however, that this effect is small since the opportunity exists for fibers of all lengths to be equally exposed to the cutting action, and that, therefore, the distribution of lengths remains essentially undisturbed. It has been reported that the pulping operation does not affect mean-length values significantly *(1, 5)*.

In Figure 1, the frequency of length values for whole fibers is given in terms of the cumulative proportion by length expressed as per cent, and this value represents the total amount (by length) of the material below any given length. In drawing these curves, the cumulative proportion was plotted against the corresponding average length of the class. The data points, which were omitted to aid legibility, showed practically no scattering on the original graph. The curves as a whole are each based on approximately 200 measurements.

The curve for the Douglas fir pulp falls below those for the other three species in the length range from a little more than 4.0 mm. to the upper limit

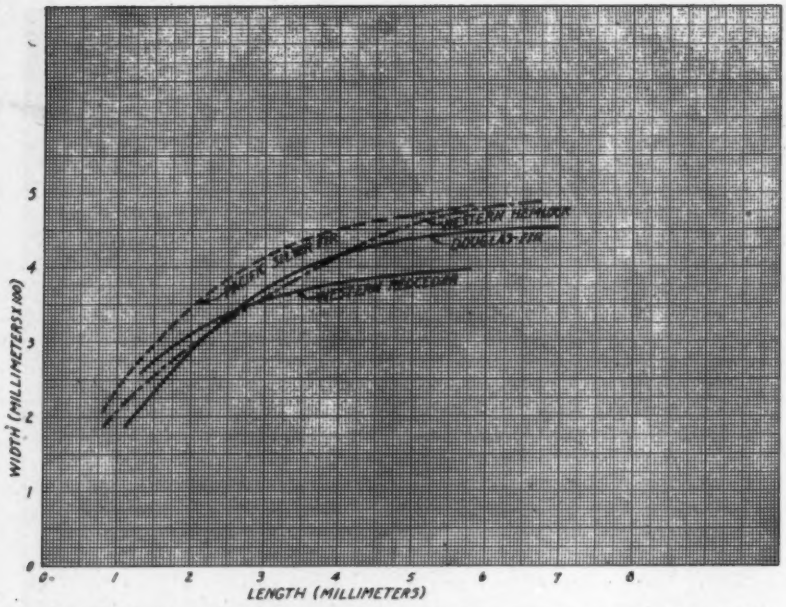


Fig. 3—Relation between width and length of whole fibers in unbeaten, unbleached sulphate pulps from four Pacific Northwest woods

of length, and thus indicates a relatively greater amount of fibers in this range. This difference is apparent in the fact that at any point on the length axis within this range, the difference between 100 per cent and the cumulative per cent at the point chosen is higher for Douglas fir than for any of the other species. With regard to a possible relation between fiber length and pulp properties, it is of interest to note that, in general, the tearing strength of this Douglas fir pulp at 800 cc. Schopper-Riegler freeness and below was substantially higher than that of the comparable pulps from the other three species (*3*).

Pulps.—Both the arithmetic-mean fiber-length and the weighted-average fiber-length values of the pulps are given in Table 1. As stated previously, the values for pulps includes whole fibers, pieces of fibers, and ray cells. Comparison of the values for these two types of averages shows how greatly the short pieces lower the value when computed on the basis of number. When the four species are compared on the basis of the arithmetic mean, the mean length for Western red cedar fibers is found to be considerably greater than for the other three, whereas when the weighted averages are compared, there seems to be little difference among them.

Length-distribution curves for the pulps are shown in Figure 2. Although data points are omitted as in Figure 1, the degree of fit in the original graph was excellent. The portion of material indicated by the curves up to 1 mm. in length is probably greater than would would be the case had distribution curves been drawn on the basis of the actual weight of material in each length class. This supposition is based on the fact that this portion of the material was found to have smaller average width, and consequently a lower weight per unit length, than the portion of pulp more than 1 mm. in length.

In the extreme upper length range, the relation of the Douglas fir pulp to the other pulps is similar to that pointed out in the case of whole fibers. That is, at any length value of 5 mm. or more, the curve shows that the Douglas fir pulp had a somewhat higher proportion of material in that range than the other three species. The Western hemlock and Douglas fir pulps had more material at 3 mm. and less in length than the Western red cedar and Pacific silver fir pulps, with the Western red cedar having the least amount in this range of all four.

Fiber Width

Whole fibers.—Average fiber-width values for whole fibers of the four species are given in Table 1. The value for Pacific silver fir is observed to be somewhat larger than those for the other three. This difference, however, is considered too small to be of practical importance, even though statistical analysis showed it to be actual and not due merely to experimental variation.

Penhallow (*8*) has reported values for the average widths and wall thicknesses of springwood and summerwood fibers that were obtained by measurement of sections of wood. Averages of his values for the tangential and radial directions for the four species discussed in this report are included in Table 2. As is true in general, these averages show that springwood fibers are wider and have thinner walls than summerwood fibers. Thus the average fiber width will vary from sample to sample as the proportion of these two types of fibers varies. Fiber-width measurements made on pulp fibers cannot be compared directly to those made on wood sections because of collapse occuring in varying degrees in the pulp fibers.

Thin-walled springwood fibers tend to result in dense papers high in bursting and tensile strengths and low in tearing strength as compared to thick-walled summerwood fibers (*2*). The data obtained by Penhallow, quoted in Table 2, for fiber-wall thicknesses show that the average for the Western red cedar is definitely less than that for the other three species. If this be generally true, it is reasonable to attribute, in part, the comparatively high bursting and tensile strengths and low tearing strength of the Western red cedar pulp to thin fiber walls.

Indicated Relation of Fiber Length and Width

An indicated relation of fiber length and width is presented in Figure 3 by somewhat idealized curves, since they were drawn through fairly widely scattered data points. Deviations were, however, carefully balanced. These curves show that longer fibers tend to be wider than shorter ones. They also give the approximate form of variation. Graff and Miller (*4*) published similar curves for fibers from several kraft pulps from coniferous woods, from which they concluded that there is a definite relation between fiber length and width.

The curves for the whole fibers from the Douglas fir, Western hemlock, and Pacific silver fir pulps have about the same form and position within the limit of error, but the curve representing Western red cedar indicates that its fibers are narrower than the fibers of the other three woods in the length range above 3 to 4 mm.

Conclusions

The arithmetic-mean lengths of the whole fibers of the unbleached, unbeaten, bleachable Douglas fir, Western hemlock, Pacific silver fir, and Western red cedar pulps examined were essentially the same. There was, however, some difference in the distribution of length of whole fibers in the length range greater than 4 mm. The Western hemlock and Western red cedar had the lowest proportions in this length range. The Pacific silver fir was intermediate, and the Douglas fir highest in this range.

The weighted-average length values

TABLE 2—Dimensions of Whole Fibers of Pacific Northwest Woods Reported by Various Investigators

Species	Source of data	Fiber length			Average fiber width		Thickness of fiber wall	
		Average	Maximum	Minimum	Spring-wood	Summer-wood	Spring-wood	Summer-wood
		Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.
Douglas-fir	Penhallow[1]	--	--	--	0.031	0.023	0.0024	0.0072 to .096
	Lee[2]	4.0	--	--				
	Wise[3]	3.2	--	--	--	--	--	--
	Griffin[4]	4.41	7.65	0.48	--	--	--	--
	Keller[5]	5.2	--	--	--	--	--	--
	Heinig[6]	3.56	6.72	1.23				
Western hemlock	Penhallow	--	--	--	.041	.036	.0024	.0072
	Mell[7]	3.04	3.63	1.73	--	--	--	--
	Keller	3.45	--	--	--	--	--	--
	McGovern[8]	3.55	(Heart-wood)					
	Heinig	2.92	6.75	1.00				
Pacific silver fir	Penhallow	--	--	--	.040	.028	.0024	.0060
	Mell	3.11	5.62	1.49	--	--	--	--
	Keller	4.35	--	--	--	--	--	--
	Heinig	3.26	5.99	1.26				
Western red-cedar	Penhallow	--	--	--	.027	.022	.0018	.0048
	Mell	3.87	4.54	3.14				
	Heinig	3.23	6.49	1.29				

(1) *Manual of North American Gymnosperms,* Appendix B, p. 358, Boston, 1907
(2) *Pulp and Paper Magazine of Canada,* 33 (13) July 1, 1915
(3) *Wood Chemistry,* Reinhold Publishing Corp., 1944
(4) These data were published in *Science,* Jan. 29, 1915 and March 10, 1916
(5) Forest Products Laboratory Report, Proj. 168-8 (April 23, 1932)
(6) Present study
(7) *Paper Trade Journal,* June 15, 1911
(8) *Paper Trade Journal* 98 (18), May 3, 1934

of the four pulps that included whole fibers, fiber pieces, and ray cells were also essentially the same. With respect to length distribution, the Douglas fir pulp had a somewhat higher proportion of material 5 mm. long and longer than the other three. The Western hemlock and Douglas fir pulps had more material 3 mm. and less in length than the Western red cedar and Pacific silver fir pulps, and the Western red cedar pulp had the least material in this range.

There appeared to be no difference of practical importance in the average width of whole fibers in the pulps examined.

There was an indicated relation between fiber length and width, as long fibers tended to be wider than short ones.

Comparison of the arithmetic-mean fiber-length values for whole fibers given in this study to values reported by other investigators based on measurements made on wood and pulp, showed appreciable variations. In view of the factors that influence fiber length, which include the natural factors previously enumerated and also chipping, it is apparent that such variations are reasonable and that the average-length value of any one sample should not be considered representative of a species.

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1) Bergman, G. K., and Backman, Albert. Fiber Length of Pulp. *Papier-Fabr.* 27, 449-456, 1929.
2) Bray, M. W., and Curran, C. E. Sulfate Pulping of Southern Yellow Pines: Effect of Growth Variables on Yield and Pulp Quality. *Paper Trade J.* 105(20) Nov. 11, 1937.
3) Bray, M. W., and Martin, J. S. Sulfate Pulping of Douglas Fir, Western Hemlock, Pacific Silver Fir and Western Red Cedar Logging and Sawmill Waste. Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N.Y. Feb. 23-27, 1947.
4) Graff, John H., and Miller, R. W. Fiber Dimensions. *Paper Trade J.* 109(6) Aug. 10, 1939.
5) Lampen, Aleks. Effect of Sulfite Cooking Process on Length and Weight of Cellulose Fibers. *Suomen Paperi-Ja Puutavarlehti* 456-458, 1931.
6) Lee, H. N. Structure of Wood and Some Other Fibers as Related to Pulp and Paper. *Pulp and Paper Mag. of Can.* 33(13) July 1, 1915.
7) Mell, C. D. Length of Tracheids in the Wood of Cone Bearing Trees. *Paper Trade J.* 52(24) June 15, 1911.
8) Penhallow, D. P. *Manual of North American Gymnosperms,* Appendix B, p. 358. Boston 1907.

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Fire Prevention . . .

(Continued from page 737

ana. The Louisiana Forest Service is authorized to enter into co-operative fire control agreements, and through its field foresters will also assist in the training of fire fighters and other educational work. Address all inquiries to the state forester at Baton Rouge, Louisiana.

Mississippi

Mississippi Forestry Commission, First Federal Savings and Loans Bank Building, Jackson, Albert A. Legett, State Forester. The Mississippi Forestry Commission is authorized to enter into co-operative fire control agreements. Fire training schools are held several times each year. Personnel other than members of the State Forest Service may attend upon application. Address all inquiries regarding co-operative work to the state forester, at Jackson, Mississippi.

North Carolina

Division of Forestry, Department of Conservation and Development, Raleigh, North Carolina. Contact state forester for any co-operative work.

South Carolina

State Commission of Forestry, State Office Building, Columbia, South Carolina, Charles Flory, state forester. The South Carolina State Forest Service is authorized to co-operate with interested parties in forest fire control and in educational and training work. Contact the state forester, at Columbia, South Carolina.

Virginia

Virginia Conservation Commission, Virginia Forest Service, P.O. Box 1368, Charlottesville, Virginia, George W. Dean, state forester. The Virginia Forest Service is authorized to enter into co-operative fire control agreements. The State Forest Service will furnish fire prevention material for pulp mills and pulpwood producers for distribution to their timber cutters and timber haulers. The Virginia Forest Service will assist pulp mills in training their woods crews in the prevention and suppression of fires, and in the proper handling of fire tools.

Oklahoma

Division of Forestry, Oklahoma Planning and Resources Board, Capitol Building, at Oklahoma City. For all co-operative work, contact the director at Oklahoma City, Oklahoma.

Texas

Texas Forest Service, Agricultural and Mechanics College of Texas, College Station, W. A. White, director. The Texas Forest Service maintains a Division of Industrial Forestry which co-operates with large timberland owners in timber management, timber marking, fire control, etc. Address all inquiries regarding co-operation to the Director at College Station, Texas.

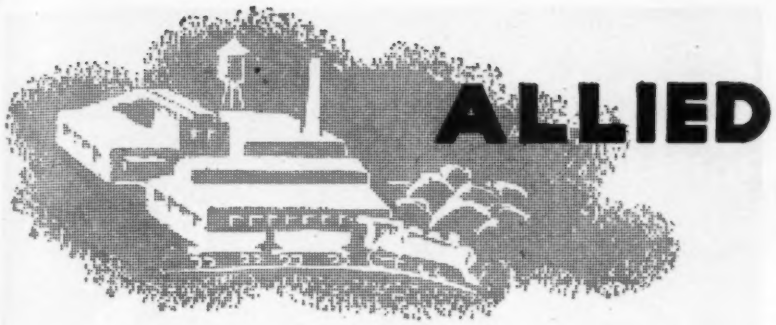
Paper SKETCHES . . . . . .

SOON TO BE MARKETED IS A "LUGGAGE-TYPE" CARDBOARD BOX AVAILABLE IN MANY COLORS WHICH IS DESIGNED TO ENCOURAGE CARRY-HOME PURCHASES FROM DEPARTMENT STORES. FOLDED INTO SHAPE, IT RESEMBLES A SMART LITTLE SUITCASE. IT MAY BE RE-USED AS A SUITCASE OR A BEACH OR PICNIC BAG.

The PAPERMAKERS OF ENGLAND WENT OUT ON STRIKE IN 1784 — 16 YEARS BEFORE THEY ORGANIZED THEIR FIRST REGULAR TRADE UNION.

RAGS IMPORTED INTO ENGLAND BY PAPERMAKERS ARE SUPPOSED TO HAVE BROUGHT TO THAT COUNTRY THE PLAGUE OF 1636.

IN COLONIAL AMERICA — ABOUT 1729 — PAPER FOR WRAPPING PURPOSES SOLD FOR 4½ SHILLINGS (ABOUT $1.08) A REAM.



G-E SHOWS TECHNICOLOR SOUND FILM ON SUBJECT OF MATERIALS HANDLING

Groups of press representatives in several large cities recently were given a preview of a film entitled "Materials Handling in Receiving, Shipping, and Warehousing," now released by the General Electric Company.

This 16 mm. all-color sound motion picture is a part of G-E's new materials handling program, thirteenth in the More Power to America series. Also a part of the new program is a 96-page Manual (reviewed in the Book Section of this issue) the purpose of which is to show industrial companies, warehousing and distribution organizations, and other groups interested in increasing production, how to reduce costs through the use of more efficient materials handling equipment and methods.

The introduction of the film highlights the fact that materials handling is one of industry's largest costs, since it is almost pure overhead and adds nothing to the value of the finished product. Outmoded materials handling techniques are shown as lost motions and hence lost dollars.

Next, in interesting sequence, are shown the various types of modern materials handling equipment, from the small self-propelled hand truck to giant cranes capable of lifting hundreds of tons. The special capabilities of each type of equipment are shown in considerable detail—the high maneuverability of the many smaller trucks in confined areas, the versatility of the battery-operated fork truck, the ability of the magnet crane to handle unwieldy objects, the role played by the diesel-electric locomotive in spotting and switching cars in large plants, and the tremendous lifting capacity of the various overhead cranes.

The remainder of the movie is devoted to the distinct advantages of the palletized unit-load method of shipping, and to a series of interesting examples of the role played by the many different conveyor systems in the handling of materials of various kinds.

The film, which runs about 20 minutes, was produced under the technical supervision of G-E materials handling authorities and in co-operation with manufacturers of materials handling equipment and their associations. Arrangements are being made for the sponsorship of the program throughout the country by equipment manufacturers, electric utilities, and local G-E offices.

▼

▶▶▶ A SERVICE AWARD banquet held by the Owen Bucket Company, Cleveland, was presided over by Edward W. Botten, secretary, and attended by almost 200 employees. Diamond studded pins and watches were awarded to 14 employees with service of 20 years or more, single diamond pins to 6 with records of 15 years, 17 ruby studded pins to employees with 10 years of service, and emerald pins to 2 employees who had served 5 years.

▼

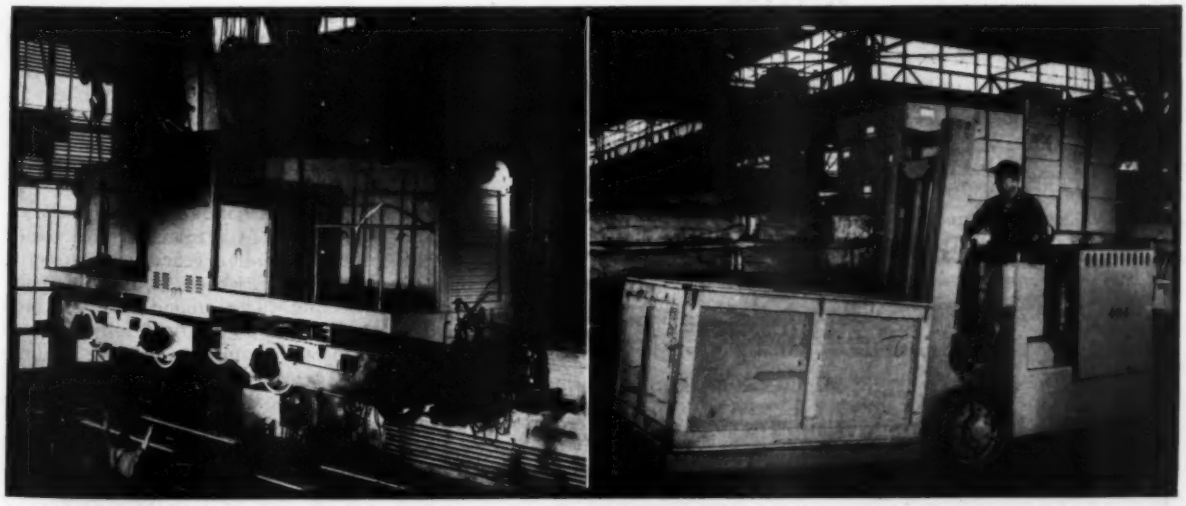
NEW CORP. SPECIALIZES IN CHEMICAL EQUIPMENT

A new sales organization, Chemical Pump and Equipment Corporation, with offices at 75 West Street, New York City, has been formed to represent manufacturers specializing in chemical processing equipment. The territory covered by the corporation is New York State east of Rochester and western Connecticut.

Officers are Robert T. Sheen, president; John W. Welker, vice president; Paul C. Flucke, secretary; and John J. Smith, treasurer. Personnel includes A. W. Lubbers and Ted J. Zeller, sales engineers, and Robert Dohen, office manager.

▼

▶▶▶ A NEW BRANCH OFFICE in Charlotte, North Carolina, has been opened by Bailey Meter Company, Cleveland. Branch manager at the office in the Independence Building is J. R. Powell, who was with the company's Pittsburgh branch office since 1942.



LEFT—Large overhead crane lowering a 47-ton Diesel locomotive on flat car. . . . RIGHT—Battery-powered fork truck moving load on corrugated paper pallet. Both scenes from General Electric's new film "Materials Handling in Receiving, Warehousing, and Shipping"

INFILCO, INC., DEVELOPS CYCLATOR FOR TREATMENT OF MILL WHITE WATERS

Infilco, Inc., Chicago, has announced the successful development of a new apparatus, known as the Cyclator for the economical treatment of paper mill white waters and other industrial wastes.

After more than ten years of research on this problem, Infilco engineers brought forth the Cyclator, designed with three main objectives in view: maximum clarification of white waters, maximum recovery of usable fibers, and minimum operating costs.

In operation for eight months, one installation treats white waters from two cylinder machines making approximately 200 tons of liner board a day. The Cyclator reduces suspended solids in the white waters from 4.5 pounds per thousand gallons to 0.25 pound per thousand gallons and effects a reduction in 5 day B.O.D. from 128 ppm. to 62 ppm. Consistency of the recovered reusable fibers has been slightly in excess of 1 per cent. Value of the recovered fibers has been about $122 per day, which is somewhat higher than total operating costs including maintenance and depreciation.

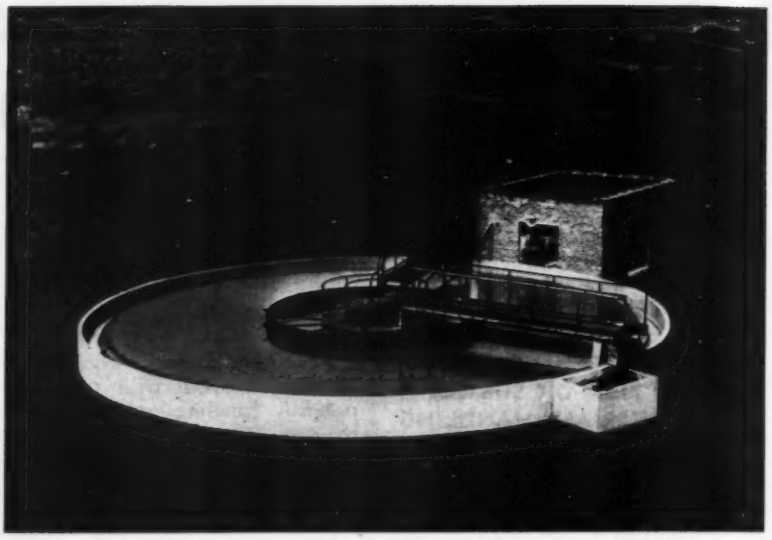
The process used in the Cyclator is particularly adaptable to treatment of wastes in which precipitate volume is upward of 10 per cent. The line diagram (Figure 1) shows the general arrangement of the Cyclator and the pattern of flow during treatment.

The process starts in the mixing zone where white waters and chemicals are added in the presence of existing solids to which the newly formed precipitates and the fibers will adhere. This unique feature of recycling previously precipitated fibers results in a number of benefits. The white water is coagulated in the presence of a thick slurry of previously formed precipitates having a volume at least twice that of the white water undergoing treatment. This method is all-important to obtain high fiber consistencies recovered for reuse as well as to obtain the absolute minimum of suspended solids in the finished water.

A variable speed circulator (a low speed, low head pump) lifts the coagulated mixture into the circulating zones. These zones consist of two concentric sections with an upward flow in the inner section and a downward flow in the outer. Flow then passes into the clarification zone where precipitates are settled out and clarified water is withdrawn at the surface.

The entire outer area of the basin is a relatively quiescent zone in which the precipitated solids settle. The solids are then thickened as they are moved to a collection sump by the rotating scraper mechanism. It is at this point that the valuable fibers are recovered for reuse.

All operating functions are controlled by a meter so that chemicals applied are proportional to white water flows and the consistency of recovered fibers is kept constant by the same control.



A typical "Cyclator" installation at plant of River Raisin Paper Co. (Monroe, Mich.)

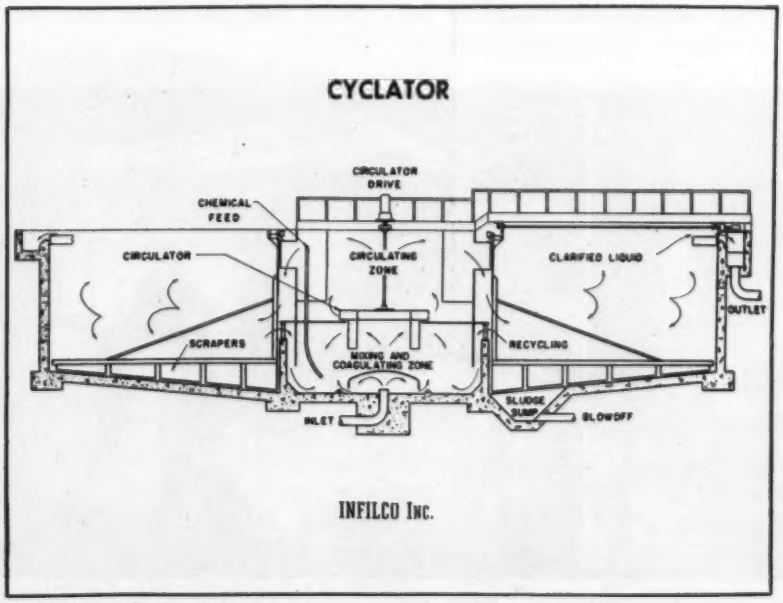


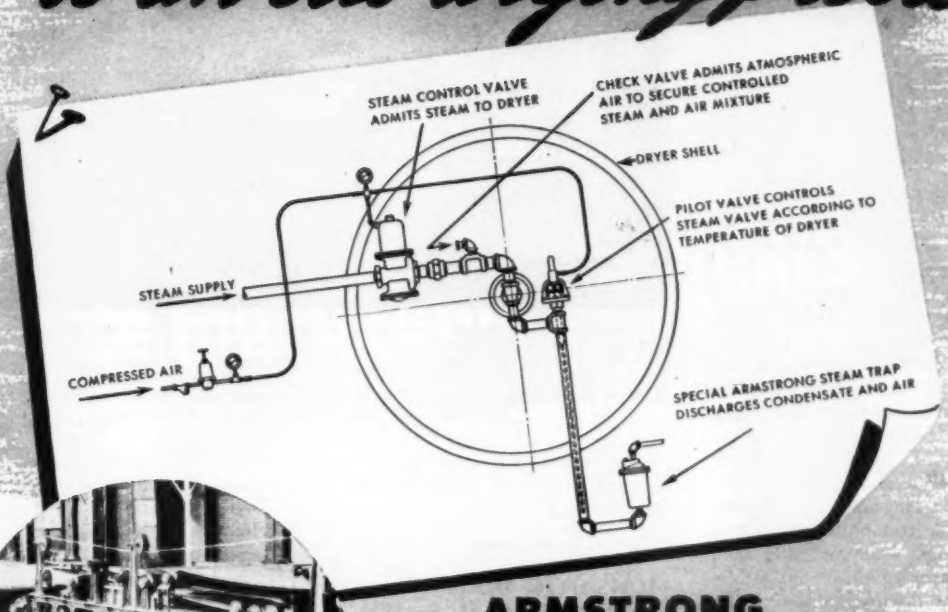
Diagram of "Cyclator." Pattern of white water flow during treatment is indicated by arrows

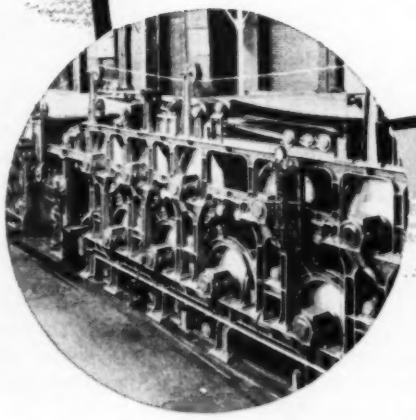
STEARNS MAGNETIC CO. OPENS PLANT ADDITION

Stearns Magnetic Manufacturing Company is moving into a modern addition to its Milwaukee plant which was erected to take care of the increased demand for magnetic equipment.

The new building will house the administrative division on the second floor, including general and executive offices with generous space for engineering. The ground floor has been devoted to an enlarged, fully equipped laboratory aimed to improve facilities for research and material testing, an important part of the company's development plans. Visitors will be received in a solid glass front lobby with specially designed lighting fixtures for complete reflected illumination and with custom built matching furniture throughout.

A NEW ANSWER
to an old drying problem


STEAM CONTROL VALVE ADMITS STEAM TO DRYER
CHECK VALVE ADMITS ATMOSPHERIC AIR TO SECURE CONTROLLED STEAM AND AIR MIXTURE
DRYER SHELL
PILOT VALVE CONTROLS STEAM VALVE ACCORDING TO TEMPERATURE OF DRYER
STEAM SUPPLY
COMPRESSED AIR
SPECIAL ARMSTRONG STEAM TRAP DISCHARGES CONDENSATE AND AIR



ARMSTRONG
Individual Dryer
TEMPERATURE CONTROL

Eliminates Picking and Curling

ARMSTRONG Individual Dryer Temperature Controls are used to accurately maintain reduced temperatures in the first four or five dryers at the wet end of a paper machine. This keeps the paper from sticking to the surface of the dryer and prevents curling due to over-drying one side of the sheet. Each dryer is controlled independently of any other dryer and can be regulated at any point from 100° to 250° F. Temperatures below 212° F are secured by controlling a mixture of steam and air in the dryer. Above 212° F, no air is mixed with the steam and control is entirely by steam pressure.

- CONTROLLED MIXTURE OF STEAM AND AIR MAINTAINS REDUCED TEMPERATURES
- EACH DRYER CONTROLLED INDEPENDENTLY
- ACCURATE AND UNIFORM
- 100° F TO 250° F RANGE
- DEPENDABLE
- COMPLETELY AUTOMATIC
- PROVEN AND GUARANTEED

The Armstrong Control is simple, dependable, and guaranteed to give satisfaction. For complete information write for BULLETIN 187 which fully describes the principle of operation and the component parts of the control.

ARMSTRONG MACHINE WORKS
816 Hoffman Street, Three Rivers, Mich.

INVERTED BUCKET STEAM TRAPS • PAPER MILL SPECIALTIES

HARRIS-SEYBOLD MAKES ORGANIZATIONAL CHANGES

Organization changes and the formation of an engineering technical committee for the Harris-Seybold Company, Cleveland, have been announced by C. W. Harrold, vice president in charge of engineering and research.

W. R. Spiller, formerly chief engineer of the Seybold Division in Dayton, has been named assistant vice president and transferred to the company's general offices in Cleveland. Other appointments announced were: A. B. Woodruff, engineer in charge of offset press development; C R. Kaddeland, engineer in charge of web and gravure press development; I. F. Niles, engineer in charge of letterpress development; and H. A. Pritchard, administrative engineer.

R. I. Haywood, formerly assistant chief engineer of the Seybold Division, succeeds Mr. Spiller as chief engineer at the Dayton plant. W. H. Wood continues as director of research.

The Harris-Seybold engineering technical committee is made up of Messrs. Harrold, Spiller, Woodruff, Kaddeland, Niles, and Pritchard. Mr. Wood and Mr. Haywood are associate members of the committee, participating at meetings where research and Seybold engineering development, respectively, are discussed. New engineering and research facilities will be available within a month with the completion of a new two-story building at the Harris Division in Cleveland.

▼

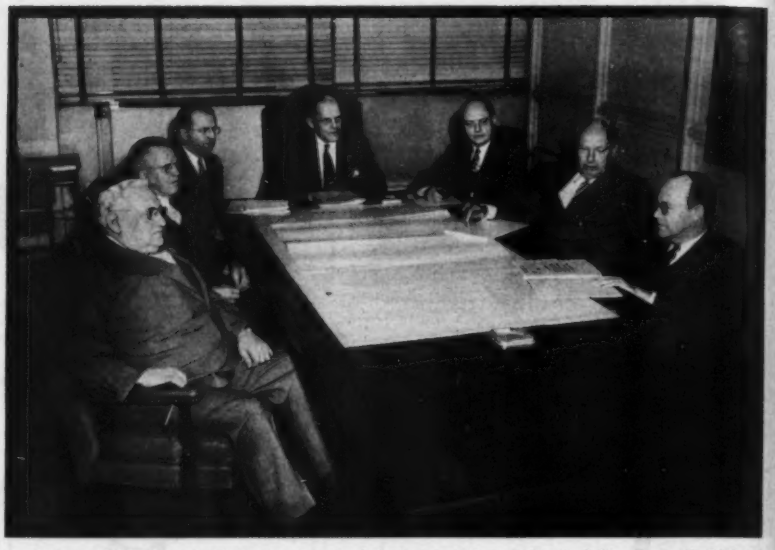
▶▶▶ THE CAPITAL STOCK of the Case Crane & Kilbourne Jacobs Company has been purchased by The Jeffrey Manufacturing Company. The two companies are located adjacent to each other in Columbus, Ohio. The Case Crane company will be operated as a subsidiary of Jeffrey with no changes in management or policies contemplated.

▼

BOOK ISSUED AS SOUVENIR OF TOUR AT LUKENS PLANT

In connection with its open house plant visitations which have attracted approximately 10,000 visitors since the summer of 1947, Lukens Steel Company (Coatesville, Pa.) has issued a 28-page booklet, "A Visit to Lukens," which is given as a souvenir of the occasion at the conclusion of each tour.

The booklet contains a message of welcome from Robert W. Wolcott, president of Lukens, a history of the company since its founding, and a description of the various mills, plants, and departments which are regularly visited on these tours. The booklet is printed in two colors, and is illustrated by photographs of scenes which visitors may easily recall.



Newly-formed Harris-Seybold Engineering Technical Committee: Left to right—C. R. Kaddeland, in charge of web and gravure press development; I. F. Niles, in charge of letterpress development; H. A. Pritchard, administrative engineer; C. W. Harrold, vice president in charge of engineering; W. R. Spiller, assistant vice president; A. B. Woodruff, in charge of offset press development; and W. H. Wood, director of research. R. I. Haywood, new chief engineer of the Company's Seybold Div. in Dayton is not shown with this group

▼

MONSANTO (CANADA) NAMES A. H. SMITH AS PRESIDENT

The election of Arnold H. Smith as president of Monsanto (Canada), Limited with offices in Montreal, has been announced. Leo G. Ryan, president since 1933 and largely responsible for the growth of the Canadian company, will remain as chairman of the board. Concurrently, L. E. Ryan was elected first vice president and will remain in charge of the manufacturing and development programs of the company.

Mr. Smith had been elected a vice president and member of the board of directors of the Canadian company in January, 1948. Prior to that time he was acting managing director of Monsanto (Australia) Pty., Ltd. Before his Australian assignment began in 1946, Mr. Smith served as director of Monsanto's Foreign Department. He first entered Monsanto's rubber service laboratory at Akron in 1922.

▼

▶▶▶ A NEW SERVICE department for Automatic Transportation Company electric industrial trucks and transporter motorized hand trucks has been opened by Lindsley and Voss, Chicago area distributors for Automatic. To expand its service facilities, Lindsley and Voss recently acquired the Austin Industrial Truck Sales and Service Company, Inc., Oak Park, Illinois.

▶▶▶ MELAMINE resins will be produced in the third unit of the new Willow Island, West Virginia, plant that has been completed by Rust Engineering Company, Pittsburgh, for Calco Chemical Division of the American Cyanamid Company (Bound Brook, N.J.). Among the uses of melamine derivatives in the paper industry is the process of rendering paper impervious to water.

▼

MEREDITH, SIMMONS, LTD. ERECTS ADHESIVES PLANT

A modernly equipped glue and adhesives plant has just commenced operations in Canada for Meredith, Simmons & Company, Ltd., the Canadian affiliate of National Adhesives. The large plant replaces the original installation which has been operated in Montreal for many years. The new plant embodies the latest developments in processing equipment, and consequently is highly mechanized.

According to Frank Greenwall, president of National Starch Products, Inc., the parent company, the new installation will produce a complete line of adhesives, pastes, and glues, as well as specialty products for use by the paper and textile industries.

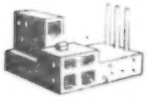
▼

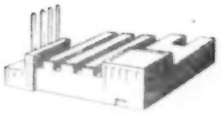
▶▶▶ THE LITHOGRAPHIC industry's own motion picture, "How to Make a Good Impression," has been acclaimed as the top public relations film of the year by the American Public Relations Association at its recent convention in Washington, D. C. Harris-

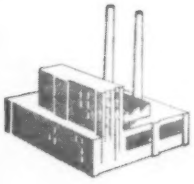
P.P.&E.
Corrugated Tangents
—for Maximum Flexibility where space is limited...

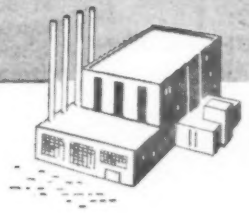
The flexibility of a P.P.&E. Corrugated Tangent is much greater than a straight pipe of equal length, diameter, and wall thickness. This inherent flexibility minimizes stresses resulting from thermal expansion, and reduces end reaction against equipment.

Corrugated tangents can be prefabricated by us in any practical design. Used alone, or together with P.P.&E. Creased Bends, they make practicable the installation of a complex system where space is at a premium.









Pittsburgh Piping
AND EQUIPMENT COMPANY
10 Forty-Third Street—Pittsburgh, Penna.

Woolworth Building, New York
Chamber of Commerce Bldg., Indianapolis
Book Tower, Detroit
525 Market Street, San Francisco
Peoples Gas Building, Chicago
Public Square Building, Cleveland
10 High Street, Boston
Heights State Bank Bldg., Houston
Whitehead Building, Akron

Seybold Company, Cleveland, was awarded the trophy for the most effective use of motion pictures and visual aids in its public relations program.

▼

▶▶▶ THE SAN FRANCISCO branch of the Foxboro Company (Foxboro, Mass.) has doubled its working space by acquiring the remaining space in its building at 266 Fremont Street. The branch serves as headquarters for Harry B. Brooks, manager of the Pacific District, with supervision over all Foxboro branches west of the Rockies.

▼

TUBE TURNS, INC., BUYS PENNSYLVANIA FORGE CORP.

In keeping with its program of steady expansion, Tube Turns, Inc., Louisville, Kentucky, has acquired the Pennsylvania Forge Corporation. George O. Boomer, president of Tube Turns, Inc., and its affiliate, The Girdler Corporation, will be chairman of the board of the Pennsylvania firm. James S. Kerwin, president, and W. T. J. Huggard, secretary and treasurer, and other officers will continue in their present capacities, and there will be no change in the personnel of the various departments. The business of the new subsidiary will continue to be operated under the name of the Pennsylvania Forge Corporation.

For several years the Pennsylvania Forge Corporation furnished Tube Turns, Inc., with flanges in all sizes. Since large quantities of flanges as well as welding fittings are sold by Tube Turns, Inc., the subsidiary gives the Louisville organization complete control over the manufacturing facilities for all of the products in its extensive lines.

The plant of the Pennsylvania Forge Corporation occupies about 12½ acres on the Delaware River in Tacony, a suburb of Philadelphia. About seven hundred people are employed.

▼

HOUGHTON & CO. OPENS NEW PLANT IN TORONTO

A prewar dream became a postwar reality when E. F. Houghton & Company of Canada, Limited, began operations in its new Toronto plant on July 15 under the direction of E. H. MacInnis, vice president and director of sales.

The new plant, an affiliate of E. F. Houghton & Company of Philadelphia, will specialize in the manufacture of metal working products such as carburizers, quenching oils, cutting oils, heat treating salts and drawing compounds, Textile processing oils for wool, cotton and synthetic yarns and surface active agents also will be manufactured, as well as industrial lubricants and mechanical leathers.

Located at 100 Symes Road in Northwest Toronto, the new plant property covers 2½ acres of ground and is geographically situated so as to take full advantage of both rail and motor shipping facilities.

Plant of the Pennsylvania Forge Corporation, new subsidiary of Tube Turns, Inc.

▼

▶▶▶ MANUFACTURE AND SALE of the Brammer Recording Consistency Control in the Dominion of Canada and Newfoundland by Alexander Fleck Limited, Ottawa, Ontario, under license agreement has been announced by Paper & Industrial Appliances, Inc., New York.

▼

BAILEY METER RECRUITS LARGE ENGINEERING CLASS

A large group of engineers reported on July 6 to the 1948 Cadet Engineering Class of the Bailey Meter Company, Cleveland. Twenty-three universities and engineering colleges are represented by the engineering students, several of whom come from Canada and England.

The course consists of lectures on the theory of Bailey meters and control systems as well as factory training in the assembly and calibration of Bailey equipment. Also included is work in the Cleveland main office, the research laboratory, and one of the branch offices. Upon completion of the course, these engineers will become part of the company's staff of over 100 resident engineers in 35 industrial areas throughout the United States and Canada.

▼

FOOT CONTROL OF SPEEDS ADDED TO CLARK TRUCKS

Foot control of speeds is now standard on all Clark electric battery-powered Carloader model fork trucks, according to J. H. W. Conklin, sales manager of the Industrial Truck Division of the Clark Equipment Company (Battle Creek, Mich.).

Placed for left-foot operation, the pedal has four control positions for the different speeds. The driver's right foot operates the brake pedal. Brake operation automatically cuts off power from the battery in second, third and fourth speeds. "Inching" is accomplished in the first point of speed.

▼

GOULDS PUMPS CELEBRATES CENTENNIAL ANNIVERSARY

A full century of industrial history has been completed by Goulds Pumps, Inc. (Seneca Falls, N.Y.). In 1848 a group of artisans in Seneca Falls devised a new type of wooden well pump banded with iron which led to the casting of the first all-iron pump two years later.

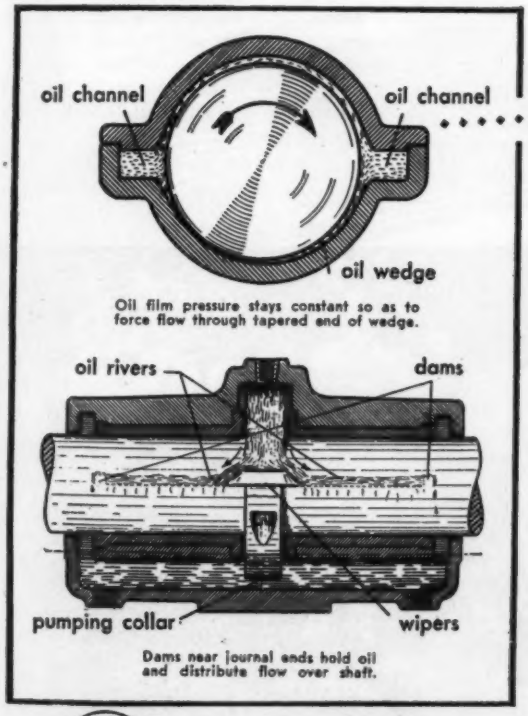
Seabury S. Gould was associated with his brother-in-law, Abel Downs, in the manufacturing firm of Downs & Company when he became interested in organizing a company for the exclusive manufacture of pumps. In 1864 the name of the company became The Goulds Manufacturing Company, and it was incorporated as Goulds Pumps, Inc., in 1926. Past presidents of the firm were James H. Gould and three members of the Gould family who bore the name of Seabury S. Gould. Norman J. Gould has been president since 1908.

▼

▶▶▶ ON-THE-JOB experience of one year in the chemical industry for university and college faculty members in chemical engineering will be provided under a new program of Monsanto Chemical Company, St. Louis. Teachers chosen will be paid the salary ordinarily paid for comparable jobs within the company, and will be expected to resume their faculty affiliations for one year at the conclusion of their Monsanto service.

sandy hill-cleveland type oil-film bearings

free of metallic friction


oil channel
oil channel
oil wedge
Oil film pressure stays constant so as to force flow through tapered end of wedge.
oil rivers
dams
pumping collar
wipers
Dams near journal ends hold oil and distribute flow over shaft.

..... shaft floats on wedge-shaped oil film

This bearing carries heavier loads, operates at higher speed, gives uninterrupted flow of power. Out-does many ordinary bearings because it is friction-free and void of metallic contact. Bearing and shaft never touch! A flowing wedge-shaped film of oil forms a cushion on which the shaft floats free. Flow is always ample. Maintenance is minimized. Large capacity oil reservoir built in the bearing bottom seldom requires refilling.

SIMPLE OPERATION — TROUBLE-FREE PERFORMANCE

Heavy split collar elevates oil from the bearing bottom. Metal wipers distribute flow along the journals. Chamfered bearing liners permit the rotation of the shaft to force the oil past the wedge opening and under the journals. Oil collar also acts as thrust collar.

Made by SANDY HILL—Pulp and Paper Machinery Specialists

Manufacturers of

- Adjustable Cylinder Vats
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- Pulp Grinders
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- Thickeners
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- Castings
- Bleaching Equipment
- Scofield Felt Conditioners
- Cleveland Type Bearings
- Shaker Screens

Sandy Hill Iron & Brass Works

Hudson Falls, N. Y.

Southern Pulpwood Conservation Association Tours Duke Forest

▸▸▸ SOME SIGNIFICANT forestry experiments being conducted in this country were witnessed recently by members of the Southern Pulpwood Conservation Association on a tour through the Duke University forest. Conducted under the auspices of the Duke School of Forestry and its Dean, C. F. Korstian, the trip embraced portions of the 7,800 acre forest belonging to Duke University.

Approximately 20 of the 100 experimental areas in the forest were included on the agenda of the tour. Of special interest to foresters and the members of the pulpwood industry were the various areas where scientific methods of experimentation are being used to determine how the South's forests can produce the most wood and at the same time be perpetuated for the future.

Under the direction of Dean Korstian and V. J. Rudolph, assistant director of the Duke Forest, experiments which were begun as long as 17 years ago are being conducted, demonstrating different types of thinning and cutting.

Seven stops, including several contiguous areas in each, were made by the motor cavalcade of some 40 cars.

Stop number one was at a natural shortleaf pine stand thinned during the war by a local pulpwood dealer using German PW labor. With an interval of 11 years separating them, two operable thinnings had been made and an adequate stand still remained.

Stop two showed (first area) two-cut shelterwood method of obtaining pine reproduction following a harvest cut. Satisfactory reproduction was obtained by using this system, with the second cutting being made seven years after the first. Area two of stop two was an experiment on converting a low quality hardwood stand into a more valuable pine stand by clear cutting of the hardwood and planting pine.

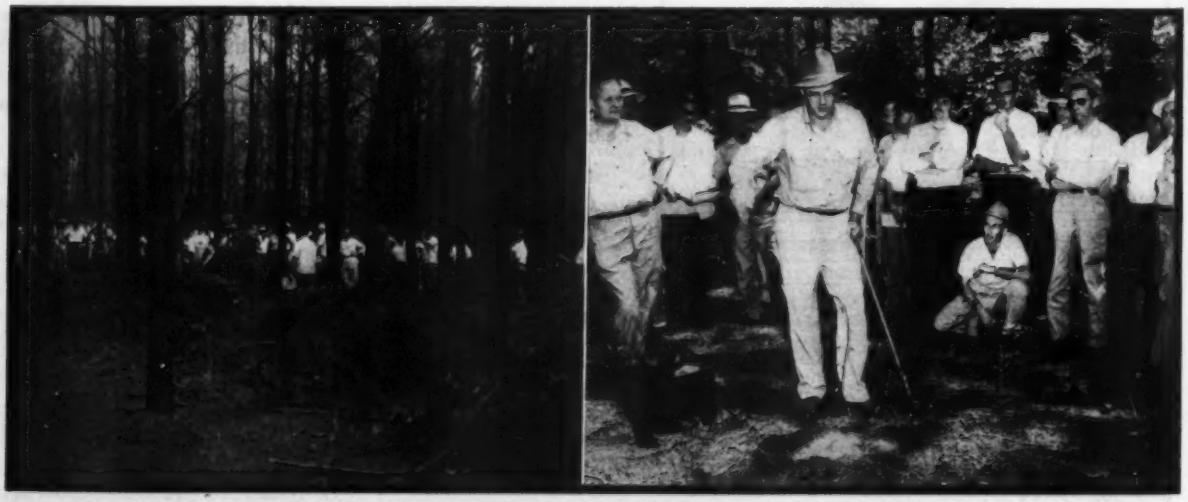
At stop three was seen thinnings in a 16-year-old loblolly pine plantation, the first at Duke to be thinned on a commercial basis. At this stop, the most significant on the tour, the crown thinning method was found to give the best results. This system requires the judgment of a forester, who selects the best developed and most promising trees which are then given an opportunity to flourish as the result of cutting out poorer trees surrounding them.

Stop four was an area showing the seed tree method of cutting which is aimed at natural establishment of pine seedlings from seed furnished by adult trees.

At stop five, selection cuttings in loblolly pine stands were observed to be unsuitable for getting young pines back on the land in this area; hardwoods filled in the openings made by the removal of pine trees. Clear cutting in patches gave more favorable results.

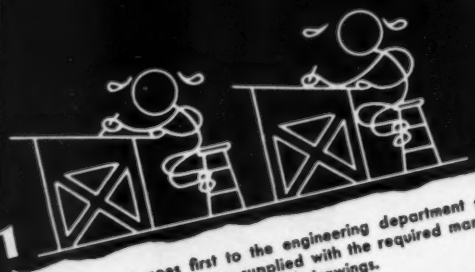
At stop six, a demonstration was given by Dr. T. S. Coile, professor of forest soils at the Duke School of Forestry, who exhibited the system developed at Duke for predicting the height of trees on any given site at any given period of their growth. Basing his calculations on the soil series and the depth of the top soil, used in conjunction with charts worked out at Duke, Dr. Coile determined the future height of pines growing on this particular site. This method, accurate within five feet, also can be used to determine the quality of land for producing pine.

Each of the three succeeding areas visited at stop six were of special im-

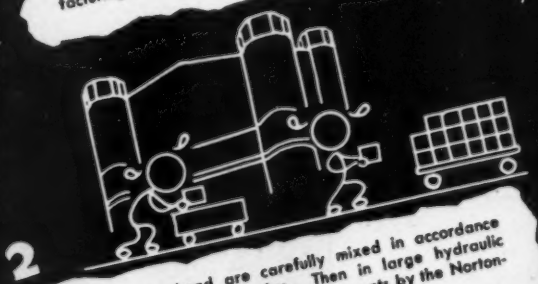


LEFT—The most effective method of thinning is demonstrated in the experimental area above, in which the hardiest and most promising trees (white circles) are selected and given an opportunity to flourish. This is called the crown thinning method, and has been found by the Duke University School of Forestry to be the most superior from the standpoint of producing an optimum supply of timber over an indefinite period of time. . . . RIGHT—Dr. T. S. Coile, professor of forest soils at Duke University School of Forestry, demonstrates a method whereby a sample of soil (center foreground) brought up by means of an auger can be used in conjunction with special charts worked at the University to predict the height of trees at any given site at any given period of their growth. It was computed that on this particular site, a pine 50 years old would have attained a height of 90 feet

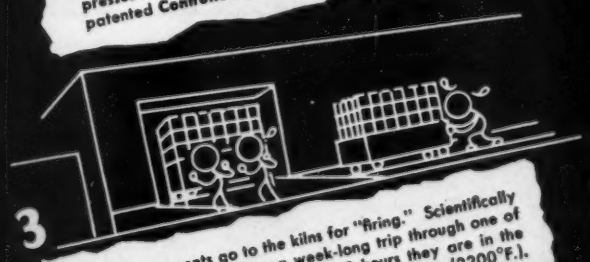
It Takes Eight Weeks and a Lot of "Know-how" to Build a NORTON PULPSTONE



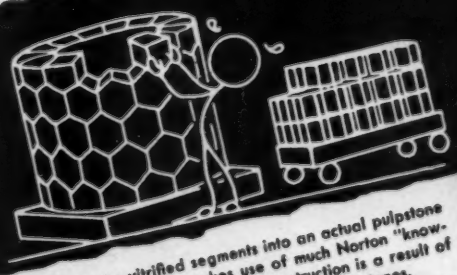
1 Your order goes first to the engineering department so that the factory can be supplied with the required manufacturing data and all necessary drawings.



2 Abrasive and bond are carefully mixed in accordance with predetermined formulas. Then in large hydraulic presses the mixture is molded into segments by the Norton-patented **Controlled Structure process.**



3 Next the segments go to the kilns for "firing." Scientifically loaded on cars they take a week-long trip through one of the long tunnel kilns. For about 30 hours they are in the "hot zone"—a third of this time at white heat (2200°F.).



4 Assembly of the vitrified segments into an actual pulpstone is another process that makes use of much Norton "know-how." The unique Norton center construction is a result of over twenty years' experience in building pulpstones.

It takes at least eight weeks to build a Norton Pulpstone—and build it right. One reason, of course, is that each Norton Pulpstone is "tailor-made" for its particular job.

First the size must be right to fit the specific grinder for which you have ordered it (diameters range from 42″ to 72″, widths from 20″ to 69″). Then the kind of abrasive and its grit size, the grade (hardness) of the stone and its structure (grain spacing) must all be right to produce **your kind of pulp** from **your kind of wood.**

Highlighted here are just a few of the many steps in the process of building a Norton Pulpstone—each one performed carefully and thoroughly by skilled workers.

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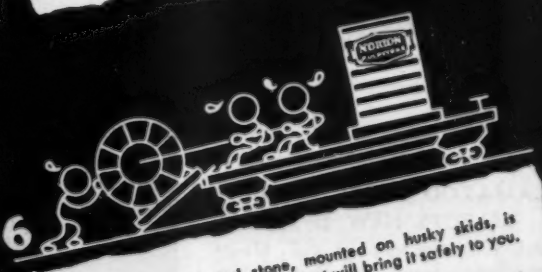
5 The finished assembly is skillfully trued—a process which requires many hours—and carefully balanced for smooth running.



6 Finally the completed stone, mounted on husky skids, is crated and loaded on the car that will bring it safely to you.

NORTON ABRASIVES

portance to foresters and representatives of the pulpwood industry. Each of these exemplified some common thinning practices which have been found in experiments at Duke to be inferior to the crown thinning system:

1—Removing the largest and best trees to sell commercially, a type of cutting often employed by many landowners. The final outcome of this practice is a straggly stand of low-value trees.

2—A stand showed the need for thinning in order to achieve the greatest volume of wood.

3—A very dense young stand where no thinning had been made. Although the volume was high, the quality of timber was low as the result of growth being slowed down due to the crowded condition of the stand.

At the final stop, number seven, was illustrated the adaptability of Piedmont soil for the various types of pines. It was seen that the loblolly pine was clearly superior to the longleaf, shortleaf, red, slash, and white pines.

▼

PACIFIC COAST TAPPI SETS 1948-49 PROGRAM MEETINGS

Dates for program meetings of the Pacific Coast division of the Technical Association of Pulp and Paper Industries were set at a meeting of the executive committee of the division at the Hotel Monticello in Longview, Washington. Harold Wall, Longview Fibre Company, was chairman. The meetings are for the 1948-49 season.

A meeting in Longview will be held on April 8, when Shibley Award Contest papers will be read. Other dates were listed as follows:

August 30-31, Portland, for a seminar to be conducted by Dr. Erdtman.

September 2-3, Seattle, for a repeat of the same seminar.

September 28, Bellingham. Subject: Engineering.

November 16, Camas. Subject: Slime Control.

January 11, Seattle. Subject: Analytic Methods.

▼

KALAMAZOO TAPPI GROUP SELECTS NEW OFFICERS

Paul Bartholomew, of the Hawthorne Paper Company, was elected chairman of the Kalamazoo Valley section of the Technical Association of the Pulp and Paper Industry at the annual get-together at the Gull Lake Country Club near Kalamazoo, Michigan. He succeeds Leon H. Mimms, Kalamazoo Paper Company, who moves to membership on the section's executive committee.

Other officers are Dr. Stephen Kukolich, Lee Paper Company, vice chairman; Dr. James Harrison, Michigan Carton Company, secretary; and Dr. Victor Bernstein, Michigan Paper Company, treasurer. The other members of the executive committee are Robert Mashburn, Hercules Powder Company, and R. C. Germanson, Kalamazoo Vegetable Parchment Company.

▼

N. Y. CANADIAN DIV. OF SUPT'S PLANS CONVENTION

Plans for a convention to be held at Lake Placid on September 23-25, were drafted at a meeting of the New York Canadian Division, American Pulp and Paper Mill Superintendents Association, in the De Witt Clinton Hotel, Albany, New York.

John D. Kane, of Rochester, conducted the meeting, and reports were submitted by Edward J. Thom, Montreal; J. O. Julson, Plattsburg; John H. Treadwell, Watertown, and Henry A. Horstmann, Syracuse. More than 300 superintendents will attend the September convention.

▼

▶▶▶ THE SUMMER MEETING of the Technical Section, Canadian Pulp and Paper Association, will not be held at Harrison Hot Springs, British Columbia, but has been changed to take place in the Hotel Vancouver at Vancouver, British Columbia. All other arrangements for the meeting, including the dates of September 8, 9, and 10, remain the same.

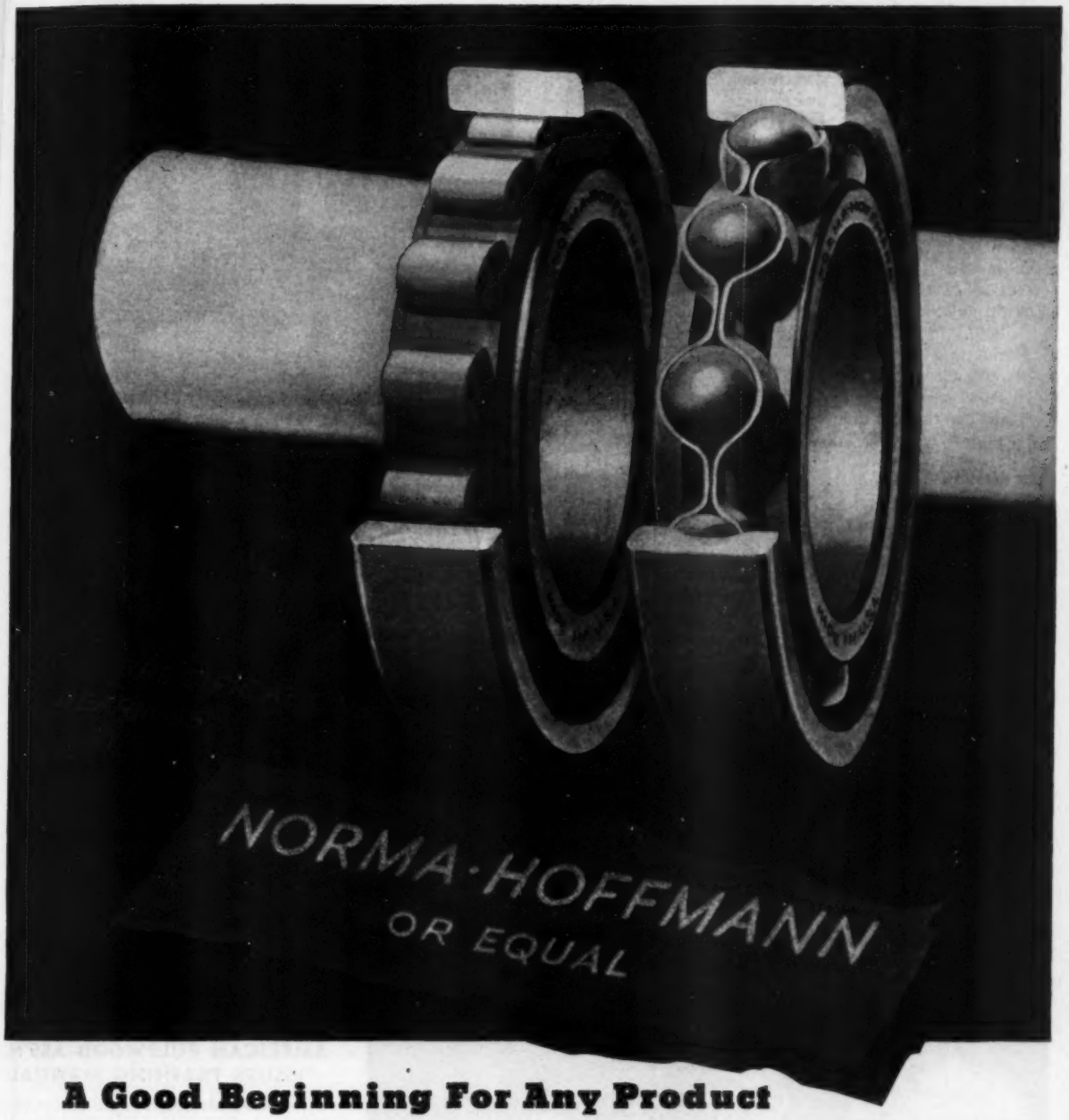
MICHIGAN DIVISION SUPTS. COMBINE ELECTION WITH ANNUAL FIELD-SPORTS DAY

At the annual sports outing of the Michigan Division of the American Pulp and Paper Mill Superntendents Association, held July 20, Herbert B. Johnston, plant engineer for the Allied Paper Mills, Kalamazoo, was elected chairman of the Division for the coming year. Mr. Johnston succeeds William H. Astle, Michigan Paper Company, Plainwell, in the chairmanship.

Other officers elected at this meet-

Herbert B. Johnston, new chairman of the Michigan Division of the American Pulp and Paper Mill Superintendents Association

A bit of fast action in a game of lawn dice at annual sports and field day of the Michigan Division of the Superintendents Association. Albert Perlick (right), superintendent at Kalamazoo Vegetable Parchment Company, has just "sevened" and is about to collect in Chinese money from Ray Barton (left), past national president of the Association, and Dr. C. G. Albert (center), technical director of Edgar Brothers Company



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ing were: first vice chairman, William F. Hathaway, Kalamazoo Vegetable Parchment Company; second vice chairman, William Shaw, Michigan Carton Company (Battle Creek); and secretary-treasurer (re-elected), Olin W. Callighan, Edgar Bros. Company.

This, the Division's combination session of business and pleasure, was held at the Gull Lake Country Club and was attended by about 125 members and representatives of concerns allied to the paper industry. A large number was present at the luncheon, after which about 50 golfers started teeing off.

A fine dinner was served in the evening and prizes were awarded by the Sports and Field Day Chairman, Paul W. Bartholomew, of Hawthorne Paper Company. In the golf tournament, low net went to Wendell R. Toben, American Box Board Company; low gross, A. E. Woollam, Gould Pumps; blind bogey, C. E. Van Buren, Albany Felt Company, who won toss to break tie with Howard L. Vanderberg, Staley Starch Company, and George Sullivan, St. Regis Paper Company.

The committee in charge of the golf and lawn games was composed of Paul W. Bartholomew, technical director, Hawthorne Paper Company; Lester J. Smith, mill manager, St Regis Paper Company; and Roy W. Holden, Stowe-Woodward, Inc.

Before the business meeting adjourned, the new chairman, Herbert Johnston, announced the details of the September meeting which will be held at the Hotel Harris in Kalamazoo on September 16. As usual, the meeting will be preceded by dinner at 6:30.

At the annual outing of the Michigan Division of the Superintendents Association, two members of the arrangements committee, Paul W. Bartholomew, Hawthorne Paper Company (left), and Lester J. Smith, St. Regis Paper Company, display prizes awarded in the golf game. Roy W. Holden, Stowe-Woodward, Inc., was the third member of the committee

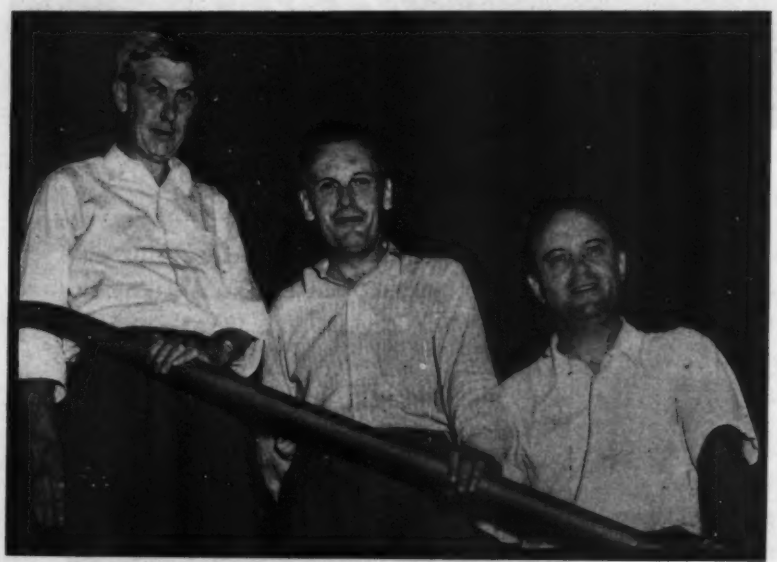
DR. EMIL HEUSER AWARDED TAPPI MEDAL AT DINNER GIVEN BY PACIFIC SECTION

The 1948 medal of the Technical Association of the Pulp and Paper Industry, presented to an individual who made an outstanding contribution to the technical advancement of the pulp and paper industry, was awarded to Dr. Emil Heuser (see P.I. and P.W., March, 1948, p. 1788).

This presentation is generally made at the annual meeting luncheon of the Technical Association. Late in 1947, Dr. Heuser retired from the staff of the Institute of Paper Chemistry and moved to Downey, California. He was therefore unable to be present at the TAPPI February meeting to receive the medal.

The TAPPI Pacific Section was commissioned to arrange for the personal presentation at a time convenient to Dr. Heuser. This was accomplished at a dinner given to him at the Janathan Club in Los Angeles on June 28. The dinner was attended by Dr. and Mrs. Heuser, their son Deitrich Heuser and his wife, Dr. and Mrs. J. A. Van den Akker of the Institute of Paper Chemistry, and H. A. Des Marias, of the General Dyestuff Company.

The presentation was made by Mr. Des Marias, a member of the Pacific TAPPI, on behalf of the Technical Association. Dr. Heuser graciously responded and wished the TAPPI members to know that he greatly appreciated this recognition and honor.



At the height of festivities during the Michigan Division's annual sports day, the cameraman found these three together: Left to right—Wm. H. Astle, Michigan Paper Company, retiring chairman of the Michigan Division of the Superintendents Association; Herbert B. Johnston, of Allied Paper Mills, who was elected to succeed Mr. Astle; and O. W. Callighan, Edgar Brothers Company, re-elected as secretary-treasurer of the Division

AMERICAN PULPWOOD ASS'N ISSUES TRAINING MANUAL

A manual designed to aid executives and supervisors in carrying out their work with greater efficiency has just been put out by the American Pulpwood Association.

Practical suggestions contained in this Manual are arranged and indexed under subjects: Job Planning, Instructor, Timetable, Instruction, Job Instruction, Job Methods, Job Relations, and Safety. H. H. Jefferson, Training Officer, has compiled much of the material. In his Foreword, he credits E. M. Olliver for some contributions to the material.

The book is looseleaf, bound in limp, imitation leather, with gold stamped cover.

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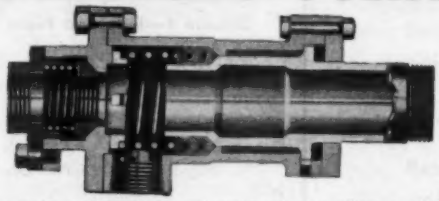

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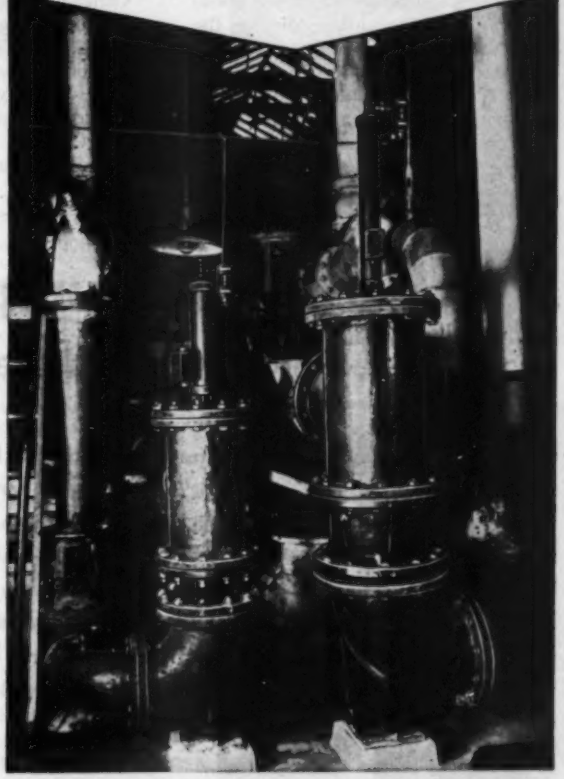

FLOWRATOR instrument installation at a large pulp and paper mill in Canada. These special streamlined, pocketless meters are controlling the ratio of two slush paper stocks. The flow rates are being accurately recorded and totalized on a remote ratio controller.

This paper stock flow meter is designed for installation right in the slush stock lines, directly at the discharge of the pump. There is no need for head boxes or return lines. There is but a single, streamlined, moving part in the pulp stream which accurately meters the volume of stock flowing, transmitting this reading electrically to a recorder, totalizer or ratio controller.

FLOWRATOR multiple ratio systems for continuously proportioning alum, size, clay slurry, resin, color or other ingredients to the pulp stream are in operation in many paper mills.

FLOWRATOR instruments are also widely used in the paper industry for continuous measurement and recording of molten sulphur flows to the sulphur burners, black liquor flows in the recovery process as well as in many other difficult-to-handle operations.

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SAFETY

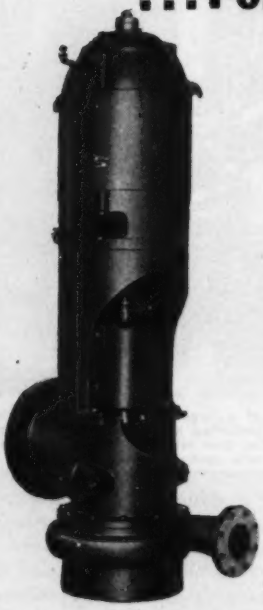
NAT'L SAFETY CONGRESS HEADQUARTERS ANNOUNCED

The Chicago hotels which will house sessions and expositions during the 36th National Safety Congress and Exposition from October 18 through October 22 have been announced by the National Safety Council. The headquarters of the Pulp and Paper Section will be the Stevens Hotel, and sessions will meet on Monday and Tuesday afternoons and Wednesday morning.

Other leading Chicago hotels which will house the sessions of various groups are the Sherman Hotel, Morrison Hotel, Congress Hotel, and La Salle Hotel. For further information, write to George E. Burns, National Safety Council, 20 N. Wacker Drive, Chicago 6, Illinois.

Centrifugal Pumps—

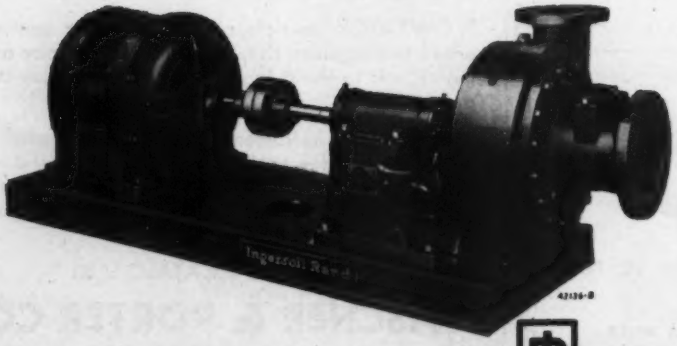
...For Pulp and Paper Mills



The many and diversified uses of pumps in pulp and paper mills are all completely covered by the long line of pumps that Ingersoll-Rand produces. From the comparatively simple task of pumping pure water to the pumping of rough stock and the strongest acids, there's an Ingersoll-Rand pump for the job.

A wealth of knowledge and years of invaluable experience stands behind each Ingersoll-Rand pump that is produced.

Write for bulletin No. 7022 or call an I-R pump engineer for more complete details.



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OIL AND GAS ENGINES

▶▶▶ THE ACCIDENT RATE at the Bathurst Power and Paper Company mill at Bathurst, New Brunswick, has decreased 27 per cent during the first six months of 1948 as compared with the same period in 1947. Officials of the mill state that the monthly safety contest conducted among the employees is mainly responsible for this drop in the number of accidents.

▼

▶▶▶ IN RECOGNITION OF ten years of driving without an accident for the International Paper Company, Niagara Falls, New York, Elmer LaGraff and Anthony Colucci were awarded service pins and certificates by the company's safety supervisor, Edward J. Lawler, at a safety meeting August 8. The men were congratulated for their record by H. P. Bailey, mill manager.

▼

SAFETY SCORES

▶▶▶ THE MAY REPORT in the Paper Industry Safety Contest which started June 30, 1947, under the sponsorship of the National Safety Council, shows that the injury frequency rate of 13.87 for all contestants in May was 8 per cent higher than the rate of 12.86 in April. Both Divisions I and II had higher rates, the rate of Division I being 6 per cent higher and that of Division II being 16 per cent higher.

The cumulative rate of 14.21 for eleven months remained about the same, as the rate for ten months was 14.24. Twelve companies remain on the perfect record list.

Division I—Pulp and Paper Mills

Group A

(None.)

Group B

(None.)

Group C

The Mead Corp. (Sylva Div.), Sylva, N.C.

Armstrong Cork Co., Pensacola, Fla.

Group D

Hollingsworth & Whitney Co. (Abenaquis Mill), Madison, Me.

Container Corp. of America, Carthage, Ind.

Certain-teed Products Corp., Dallas, Tex.

Riegel Paper Corp. (Hughesville Plant), Riegelsville, N.J.

Kimberly-Clark Corp., Kapuskasing, Ont., Can.

Division II—Paper & Board Manufacturing

Group A

(None.)

Group B

Canadian Cellucotton Products Co., Ltd., Niagara Falls, Ont., Can.

Old Colony Envelope Co., Westfield, Mass.

Group C

Thilmany Pulp & Paper Co. (Bag. Mill), Kaukauna, Wis.

The Flintkote Co. (Hollywood Paper Box Div.), Los Angeles, Calif.

Bay West Paper Co., Green Bay, Wis.

NAMES in the News

Douglas Nelson Spaulding WHITE CLEVELAND Smith Clark Arthur Wolf Morris Simpson Kraft Bryan Temple

PERSONALS

DAVID KNOWLTON ELECTED PRES. OF KNOWLTON BROS.

David C. Knowlton, vice president of Knowlton Brothers, Inc. (Watertown, N.Y.), was elected president of the company at a recent board of directors' meeting. He succeeds his father, Theodore Ely Knowlton, who was elected chairman of the board of directors. As chairman of the board, Mr. T. E. Knowlton succeeds his half-brother, the late G. Seymour Knowlton, who was the head of the board until his death last December.

Other officers elected at the meeting are: Robert W. McCormick, vice president; James C. McCormick, treasurer; and E. Way Clarke, secretary. All were re-elected.

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▶▶▶ *T. B. L. Young* has been transferred to the Canadian International Paper Company's mill at Three Rivers, Quebec. A farewell dinner was presented upon his leave from the Dalhousie, New Brunswick, mill of the New Brunswick International Paper Company where he has been technical control superintendent for the past several years.

▼

ST. REGIS CO. APPOINTS SEVERAL NEW MANAGERS

The St. Regis Paper Company, New York, and its subsidiary, the St. Regis Sales Corporation, have announced the promotion of several of its members to managerial positions.

William A. Zonner has been chosen by the St. Regis Paper Company to manage its mill at Deferiet, New York. He succeeds Edward F. Marshall whose resignation as general manager of the Deferiet, Harrisville, and Norfolk mills became effective July 1. Mr. Zonner comes to St. Regis from the Appleton Machine Company, Appleton, Wisconsin. Prior to that he was associated with the Consolidated Water Power & Paper Company and with The Mead Corporation.

The St. Regis Sales Corporation has appointed Alan B. Helffrich as general sales manager of its Printing, Publication and Converting Paper Division. He has been with St. Regis during the past twelve years. Previously he worked for Fraser Paper Company, Ltd., Eastern Corporation, Price Brothers, Ltd., and the Orono Pulp and Paper Company. He is a national vice president and charter member of the Salesmen's Association of the Paper Industry.

William H. Donaldson, Jr., succeeds Mr. Helffrich as Eastern sales manager of the Printing, Publication and Converting Paper Division. Before joining St. Regis fifteen years ago, Mr. Donaldson was with Perkins Goodwin Company and Bermingham & Prosser.

Another appointment of the St. Regis Sales Corporation is that of Howard C. Bryan as manager of the Minneapolis office of the Multiwall Bag Division of the corporation, succeeding H. A. Hughes, Jr., who has been transferred to the head office of the company in New York. Formerly assistant manager of the Denver office, Mr. Bryan had worked with the American Bridge Company and with the Thompson Pipe and Steel Company before joining St. Regis in 1946.

The St. Regis Sales Corporation also has appointed George P. Haberstein as eastern sales manager and Logan G. Hill as assistant eastern sales manager of the Multiwall Bag Division of the company. Walter M. Neill, formerly eastern sales manager, was recently elected a vice president of St. Regis Sales Corporation.

Mr. Haberstein became associated with St. Regis late in 1947 as assistant manager of the advertising, publicity and sales promotion department. Previously, he had been associated with Union Bag and Paper Corporation and with the Scott Paper Company. Mr. Hill has been connected with sales promotion and multiwall sales of St. Regis since 1930, both in New York and Chicago.

Alan B. Helffrich

H. C. Bryan

George P. Haberstein

JOHN HERB, FOUNDER OF WESTMINSTER & PACIFIC COAST MILLS, HONORED

On the occasion of his sixtieth year in the papermaking industry, John James Herb was honored recently at a banquet given by the directors and key employees of Westminster Paper Company (New Westminster, B.C.) and Pacific Coast Paper Mills (Bellingham, Wash.). Mr. Herb was presented with a sterling silver tray engraved with pictures of the two pioneer plants which he had founded.

Mr. Herb was 15 years old when he started working at Thilmany Paper Mills, Kaukauna, Wisconsin. He advanced steadily and in 1905 was made mill superintendent. In 1912 he built the Interlake Paper Mills in Ontario. Ten years later he built the Westminster Paper Company mill, the first papermaking mill on the Pacific coast.

In 1925, Mr. Herb decided to expand and chose Bellingham, Washington, as the site for the first papermaking mill to be built in the Pacific coast states. Recent expansion at the mills has included $2,250,000 plant additions and new machinery at the Westminster mill and the replacement of the No. 2 papermaking machine at the Bellingham company.

In 1945 Mr. Herb resigned as president of both companies and assumed the chairmanship of the boards of directors. He was succeeded by his son, Elmer M. Herb, as president of Westminster Paper Company, and by F. J. Herb, a younger son, as president of Pacific Coast Paper Mills.

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▶▶▶ The position of advertising and sales promotion manager of the Philip Carey Manufacturing Company, Cincinnati, has been given to *Frank J. Smith*. He succeeds *Harold D. Bates*, now general merchandise manager. Prior to joining the Carey firm last January, Mr. Smith had been in the sales and advertising department of the Owens-Corning Fiberglass Corporation.

▼

DR. NADELMAN HEADS PAPER CURRICULUM AT WESTERN MICH. COLLEGE

Dr. Alfred H. Nadelman has been appointed as head of the new Pulp and Paper Technology curriculum which will be inaugurated at Western Michigan College in Kalamazoo, Michigan, this fall. For the past four years Dr. Nadelman has been technical superintendent and chemist for the International Paper Company at Niagara Falls, New York.

On his 60th anniversary in the paper industry, J. J. Herb (center), founder of Westminster Paper Co. and Pacific Coast Paper Mills, was honored at a banquet. He is shown admiring silver tray engraved with pictures of both plants. Shown with him are his sons, Elmer M. Herb (left), president of Westminster Paper Co., and F. J. Herb (right), president of Pacific Coast Paper Mills

A native of Germany and now a United States citizen, Dr. Nadelman received the Ph.D. degree from the University of Berlin in 1929, majoring in organic chemistry. Since coming to the United States in 1938 to take charge of control and development laboratories of Milprint Inc. (Milwaukee, Wis.), he has taken advanced studies at numerous universities. From 1940-1944 he was associated with the Glassine Paper Company, Philadelphia. He also served as consultant for clients of Valley Forge Laboratories, a division of the Glassine company.

Dr. Alfred H. Nadelman

Since 1944 he has been with the International Paper Company, where he heads a department staffed with forty-five technicians. He has supervised work on deinking of waste paper, bleaching, stock preparation, color problems, sizing, fiber recovery, water problems, and on development of new grades of paper. He has also dealt with cost problems and cost analysis, handled customers' service and complaints, and collaborated with the engineering department in the selection and installation of new machinery.

Dr. Nadelman has written numerous articles published in this country and abroad. He is a member of the American Pulp and Paper Mill Superintendents Association and the Technical Association of the Pulp and Paper Industry and served for two years as general chairman of the Western New York State Group of TAPPI.

▼

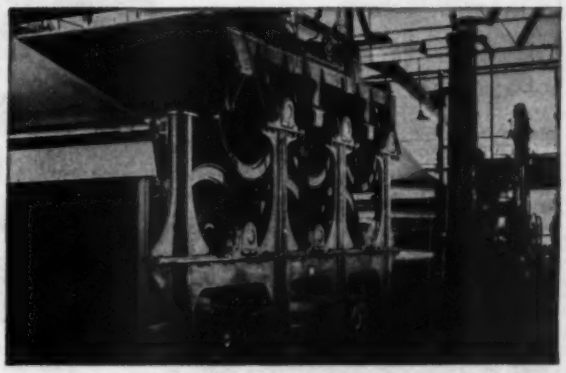
▶▶▶ The addition of *Bradford W. Brown* to its staff has been announced by Container Laboratories, Inc., Chicago. He will serve clients in the states of Wisconsin and Minnesota as research executive with an office in Milwaukee. Previously he was connected with Container Corporation of America for eleven years and did consulting work in the packaging field.

▼

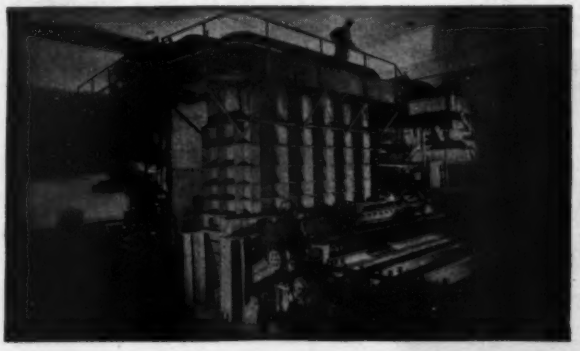
▶▶▶ Almost fifty years were spent in the papermaking industry by *James Leonard* who recently retired as superintendent of the Island mill at Ticonderoga, New York, of the International Paper Company. He was among the 140 employees of the Ticonderoga mills who were honored for twenty-five years or more of service at a banquet during the anniversary celebration of the company.

Built by LUKENWELD for the Pulp and Paper Industry

Complete drying machinery, processing machines, and flow box equipment, designed, built and completely machined by Lukenweld, are among products offered the paper industry. By integrating the machinery units with weldments, the well-known advantages of welded steel construction, such as higher predictability, improved appearance, reduced weight and increased strength, with design flexibility, are incorporated in the finished machines. Machinery like that pictured here is helping industry to make production records all over the world.

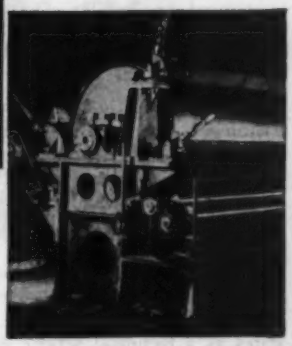


Drier addition to a machine for the production of heavyweight paper, designed and built by Lukenweld for a large paper manufacturer. This unit, 15 feet long by 7 feet high, employs six Lukenweld Jacketed Drier Rolls, 4 feet OD.



Paper machine flow box engineered and built by Lukenweld in collaboration with one of the country's foremost paper concerns. Lukens Stainless-Clad Steel reduces maintenance and improves product quality.

Yankee drier for a paper machine, manufactured by Lukenweld for exporting to South America.



One of a number of machines for coating and painting linoleum, oilcloth and similar materials, redesigned and built and machined completely by Lukenweld to replace previous cast designs, in a production line. Welded steel construction has resulted in weight saving and stronger, impact-resistant units. Water is the cooling medium used in the coating rolls.

Lukenweld supplied 20 Jacketed Drier Rolls, assembled with frames, bearings, gears, steam joints and reduction gear units. Lukenweld designed, built and completely machined this unit. Twenty driers at the customer's plant were transferred to these frames on the wet end of the machine.

Using the combined facilities of its own plants and those of its neighboring affiliates, Lukens and By-Products Steel, Lukenweld has constant control of production, assuring you of high-quality products. May we help you? Write Lukenweld, Division of Lukens Steel Company, 408 Lukens Building, Coatesville, Penna.

LUKENS
LUKENWELD DIVISION

DESIGNERS, ENGINEERS AND MANUFACTURERS OF MACHINERY

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

F. H. GORDON RETIRES AS LUKENS VICE PRESIDENT

F. H. Gordon, vice president of Lukens Steel Company (Coatesville, Pa.), who started as an office boy with the concern fifty-three years ago, retired June 30 from active work. His future plans were not announced. A dinner in his honor was given at the Coatesville Country Club and he was presented with a sterling silver tea set, on behalf of Lukens board of directors, and with two sterling silver bowls by his business associates.

Mr. Gordon, who celebrated his seventieth birthday last May, started to work with the sales department of the concern in 1895, upon his graduation from Coatesville High School. In 1903, after filling various clerical positions, he was named assistant general sales agent, and in 1907 he became general sales agent. He was elected a vice president in 1928 and had continued to serve in that capacity until his retirement.

▼

PAUL EASTON NOW SALES MGR. SPECIALTY PRODS. BULKLEY, DUNTON PULP CO.

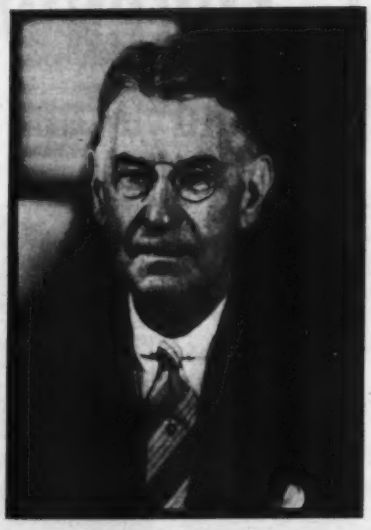
The appointment of Paul Easton as sales manager of the Specialty Products Department, which handles the sale of Sveen Pedersen Savealls, has been announced by Bulkley, Dunton Pulp Company, Inc., New York. Mr. Easton will have his headquarters in the company's New York offices.

Before joining Bulkley, Dunton, Mr. Easton was connected with the Papermakers' Chemical Department of Hercules Powder Company since 1936. His first assignment with Hercules was as a chemist in its Kalamazoo, Michigan, laboratories. In 1939 he was transferred to the Wilmington, Delaware, offices where he covered the paper mills in the middle Atlantic states as a technical service and sales representative, until he was assigned in 1945 to the Milwaukee, Wisconsin territory. He was very active among the paper mills in that area until his recent resignation.

▼

MILAN BOEX APPOINTED NEW OPERATING HEAD OF NORTHERN PAPER MILLS

Milan Boex, former sales manager and assistant to the general manager of Northern Paper Mills (Green Bay, Wis.), was elected executive vice president and general manager July 15 by the board of directors. He assumes the duties of the late A. B. Hansen. No announcement was made concerning the appointment of a successor to Mr. Hansen as president of the company or to serve on the board of directors in his place.



F. H. Gordon

Paul Easton

Milan Boex

A member of the company for approximately twenty-five years, Mr. Boex had been temporarily in charge of the mill's operations following the death of Mr. Hansen. Shortly after joining Northern Paper Mills in the converting department in 1923, he spent a year in the northern section of the United States as a member of the sales staff. Later he became southern representative with headquarters in Atlanta. In 1929, he was recalled to Green Bay and received an appointment as assistant sales manager. In 1936 he became general sales manager, and in 1941 accepted the additional appointment of assistant to the general manager.

Herbert L. Nichols has been appointed general sales manager of the Northern Paper Mills to fill the position vacated by Mr. Boex. Mr. Nichols has been with the company since 1915 and has been located in Green Bay since 1935 as assistant general sales manager.

▼

SEC. OF STATE MARSHALL HONORED AT ASME MEETING

Secretary of State George C. Marshall received a certificate of honorary membership in The American Society of Mechanical Engineers, in a brief ceremony during an informal luncheon July 9 in his honor at the Hotel Statler, Washington, D.C. E. G. Bailey, president of the ASME, conferred the honor.

Secretary Marshall was cited by the engineering society "for his distinguished services in military science and as Chief of Staff and General of the Army during World War II and as present Secretary of State." Some twenty officers of the ASME and guests attended the luncheon, including three past presidents of the ASME: Ralph E. Flanders, Republican senator from Vermont; D. Robert Yarnall, president of Yarnall-Waring Company, Philadelphia; and Eugene W. O'Brien, Atlanta engineer and publisher.

▼

EASTMAN PROMOTIONS

Three executive promotions at Kodak Park Works have been announced by the Eastman Kodak Company, Rochester, New York.

John P. Helphrey has been appointed superintendent and assigned to staff duties in the office of the general superintendent of the paper division. Formerly assistant superintendent in the paper sensitizing department, he had been in charge of emulsion-making and coating for photographic papers since 1936.

Willis H. Jennens has been named

Simplify valve selection...

WITH THIS

LUNKENHEIMER

"RENEWO" THREESOME!

The "RENEWO" Threesome is fully described in Circular No. 577, which also explains the economy feature of converting one type to another by simply changing seat and disc. A copy is yours for the asking . . . from your Lunkenheimer Distributor or from us direct.

ESTABLISHED 1862

THE LUNKENHEIMER CO.

—"QUALITY"—

CINCINNATI 14, OHIO, U. S. A.

NEW YORK 13 CHICAGO 6
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YOUR LUNKENHEIMER DISTRIBUTOR . . .

Provides Better Valve Service . . . Lunkenheimer Distributors are located in the principal industrial centers. There is one near you, fully equipped and ready at all times to assist with your maintenance and operation problems. Call on him.

1 REGULAR TYPE...

Fig. 73 200 lb. S.P.
Fig. 16 300 lb. S.P.

Regular "RENEWO": one of the most popular and widely used valves ever designed for general service. As the name clearly implies, all parts are renewable.

2 "P" TYPE...

Fig. 73-P 200 lb. S.P.
Fig. 16-P 300 lb. S.P.

"P" (Plug Type) "RENEWO": for throttling, drain, drip, water column blowdown and similar service. The "N55" Nickel Alloy 330 Brinell seating material, developed and patented by Lunkenheimer, has exceptional wearing qualities and high corrosion resistance.

3 "PS" TYPE...

Fig. 73-PS 200 lb. S.P.
Fig. 16-PS 300 lb. S.P.

"PS" (Plug Type) "RENEWO": for maximum resistance to the effects of close throttling and other severe service, particularly where abrasive conditions are encountered. Equipped with stainless steel 500 Brinell seat and disc.

an assistant superintendent in the paper sensitizing department. Previously he was production supervisor of emulsion-making and coating in the department.

Dr. Richard V. Young will serve as assistant superintendent in the paper sensitizing department. Dr. Young has done much research in the field of color photography and has several patents to his credit.

▼

R. I. PARKER ELECTED A VICE PRESIDENT AT G-E

R. I. Parker has been elected a commercial vice president by the board of directors of the General Electric Company (Schenectady, N.Y.). Effective July 1, Mr. Parker succeeded W. O. Batchelder, who retired after forty-three years' service.

With headquarters at Chicago, Mr. Parker will have charge of customer relations in Illinois, Michigan, Wisconsin, Minnesota, Iowa, Eastern Nebraska, Kansas, Missouri, and Western Tennessee.

Mr. Parker joined the General Electric Company as a student engineer on the Test Course at Schenectady. In April, 1913, he was transferred to the lighting engineering department. He later joined the sales force of the Chicago office in 1919, becoming assistant manager of apparatus sales there in 1921. He was appointed district manager of the G-E Central Station Department in 1924, and assistant district manager of the central district in 1941. He was named manager of the G-E Apparatus Department's Central District in 1945, the post he held until his recent appointment.

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▶▶▶ A six week trip to the West coast is planned by *Walter B. Morehouse,* paper chemicals division manager of Nopco Chemical Company (Harrison, N.J.). He will be joined by *Joseph E. Connell* who will be introduced to the trade at industrial processing plants throughout northern California, Oregon, and Washington.

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▶▶▶ The Duraloy Company (Scottdale, Pa.) has announced the appointment of *J. B. Dear* as assistant sales manager. Mr. Dear has been with the company for many years in the factory sales office.

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▶▶▶ A farewell party at Lake George, New York, was given for *Fred B. Chapman* on July 12 following his retirement as treasurer of Finch, Pruyn and Company, Inc., of Glens Falls, New York. Forty-eight officers and employees were present.

H. L. WATSON RETIRES AS PRES. OF DE LAVAL CO— G. W. SMITH, JR., ELECTED

The president of De Laval Steam Turbine Company (Trenton, N.J.), H. L. Watson, has retired after thirty-five years of active service, and George W. Smith, Jr., has been elected as his successor. Mr. Watson will continue to be part of the company's management in the capacities of a director and chairman of the executive committee.

Before becoming associated with De Laval in 1947 as assistant to the president, Mr. Smith was engaged in industrial engineering consulting services as the senior member of the New York firm of Smith and Wood, Inc. Mr. Watson directed the affairs of the De Laval company as executive vice president from 1935 to 1942 and as president since 1942.

George W. Smith, Jr.

▼

▶▶▶ Representative for the Flexible Steel Lacing Company, Chicago, in the New England and New York territory is now *William W. Hickey.* He succeeds *John Ramsey* who has been transferred to the executive sales office in Chicago. Mr. Hickey's appointment came after intensive training in the company factory.

▼

ARCHIBALD SHARKEY MADE SMITH PAPER SALES MGR.

Archibald Sharkey has been named sales manager of Smith Paper, Inc., Lee, Massachusetts. For the past five years this position has been held by Walter F. Tatum, vice president and general manager.

Mr. Sharkey has had an extensive career in the paper industry. He has been a member of the production staffs of Crane Paper Company in Dalton, the Rolland Paper Company, Ltd. in St. Jerome, Canada, and Rising Paper Company in Housatonic. In 1945 Mr. Sharkey came to Smith as a member of the sales department in charge of the sales of Smith's Carbonizing and Bible papers.

▼

▶▶▶ Election of *Kenneth G. Sell* to the office of vice president in charge of sales for the Detroit Sulphite Pulp & Paper Company, Detroit, Michigan, has been announced. Mr. Sell first became associated with the company in 1930 and has been sales manager for the past twelve years.

▼

MURRAY BENNETT RESIGNS FROM STEBBINS ENG. CO.

Murray H. Bennett has resigned from Stebbins Engineering and Manufacturing Company, Watertown, New York, effective August 1.

Mr. Bennett joined the Stebbins organization in 1927 and was active as a field supervisor for a period of nine years on installations of linings in the sulphite mills in the United States and Canada. From 1936 to the present time he was serving as sales and development engineer on all applications of acid resisting and process linings and industrial equipment in the Middle West and Northeast of the United States.

Mr. Bennett was vice chairman of the Sulphite Pulping Section of the American Pulp and Paper Mill Superintendents Association and was formerly an officer of the Empire State Section of the Technical Association of the Pulp and Paper Industry.

▼

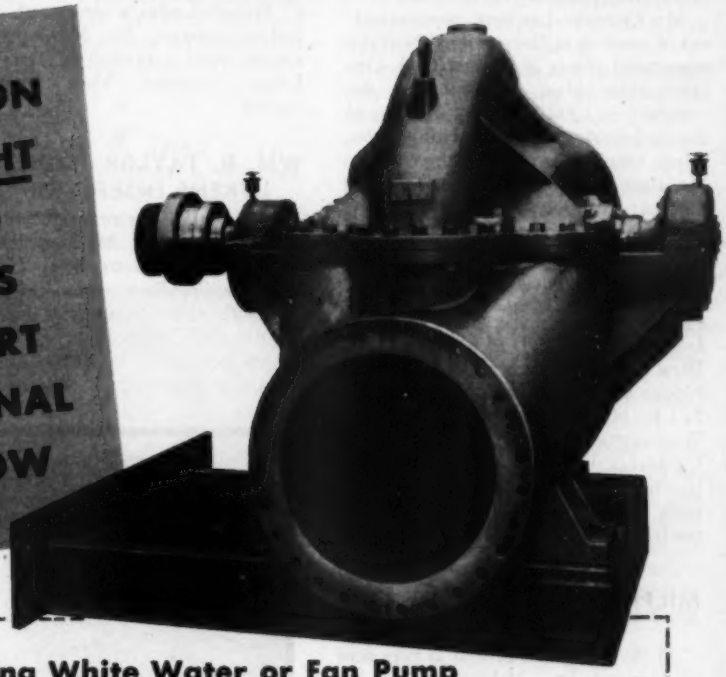
R. G. SANDS VISITS U. S. FOR CARRIER-ROSS COMPANY

R. G. Sands of Carrier-Ross Engineering Company, London, England, arrived in the United States recently to visit prominent paper manufacturing and converting plants in this country. While here he spent much of his time with various officials of the J. O. Ross Engineering Corporation, of which his company is an English affiliate.

With Ross Engineering executives in New York and Chicago, Mr. Sands was able to see the equipment and operations in many plants, including Behr-Manning Corporation at Troy, New York; Millprint, Inc., Stoughton, Wisconsin; paper mills of Consolidated Water Power and Paper Company at Wisconsin Rapids and Biron; Rhinelander Paper Company, and the converting division of Time Inc., at Kalamazoo, Michigan.

A PROVED WAY TO BETTER PROCESS-PUMPING

WORTHINGTON FITS THE RIGHT PUMPS TO YOUR JOBS WITH EXPERT APPLICATIONAL KNOW-HOW



An Outstanding White Water or Fan Pump

Of quality materials throughout, machined to rigid tolerances, the Worthington Type LA is the last word in single-stage volute design — hydraulically and mechanically. And you have your choice of three variable speed power hook-ups — for steam, for constant speed motor through magnetic coupling, or for multi-V drive — all engineered by Worthington.

For all heads and capacities, with consistencies up to 1%.

Take any Worthington Centrifugal Pump, examine it feature by feature, and you'll see what it means to have the greatest research and manufacturing facilities in the field. For Worthingtons are heavier, more solid—built to last longer, with many exclusive design improvements for better performance.

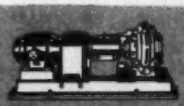
The Type LA is just one of Worthington's comprehensive range of paper-processing pumps—each built to give you peak efficiency and economy in the work for which it was designed.

And for best results in *every* application, Worthington draws on the biggest stockpile of practical knowledge in the business—built up through more than 100 years of experience. For further proof that *there's more worth in Worthington*, call our nearest District Office. Or write to *Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.*

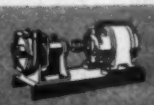
WORTHINGTON

CB-7

THE WORLD'S BROADEST LINE ASSURES YOU THE RIGHT PUMP FOR EVERY JOB



CENTRIFUGAL STOCK PUMPS Type FP. Handle all kinds of stock up to 7% consistency. 4 sizes. Capacities up to 6000 GPM; heads up to 200 ft.; speeds up to 1750 RPM.



GENERAL PURPOSE PUMPS Type CP. Open impeller. Single stage. Sizes 1" to 4". Capacities up to 1000 GPM; heads up to 130 ft.; speeds up to 2475 RPM.

BOILER FEED PUMPS Type HB-2. 7 sizes. Capacities up to 1500 GPM; heads up to 1000 ft.; speeds up to 3600 RPM.

PAUL QUENEAU APPOINTED METALLURGICAL ENGINEER OF INTERNATIONAL NICKEL

Paul Queneau has been appointed metallurgical engineer of The International Nickel Company of Canada, Limited, and its subsidiaries, with headquarters at New York.

Mr. Queneau has been superintendent of research at International Nickel's mines and plants at Copper Cliff, Ontario, since May, 1941. Joining the company in 1934, he was a member of the technical staff of its Huntington, West Virginia works for three years. He then was transferred to Copper Cliff as research engineer. W. K. Sproule will succeed him as superintendent of research at Copper Cliff.

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▶▶▶ Transfer of *Joseph E. Connell* from the New England territory to the West coast has just been announced by Nopco Chemical Company (Harrison, N.J.). His new territory will include Washington, Oregon, and Northern California. Formerly serving in both the home and Boston offices, he has been with the company for more than twelve years.

▼

MILPRINT, INC., NAMES WILLIAM HELLER PRES.

M. T. Heller has retired as president of Milprint, Inc., Milwaukee, and has been elected chairman of the board of directors. He was succeeded in the presidency by his brother, William Heller, formerly vice president of the firm.

The retiring president founded the company nearly fifty years ago, and was a pioneer in packaging in cellophane, glassine, pliofilm, and foil.

Other changes in Milprint's staff include the appointment of Roland N. Ewens as executive vice president and treasurer; Arthur Snapper, secretary and assistant treasurer; Roy E. Hanson, vice president in charge of sales; Bert Hefter, vice president and sales manager; Lester R. Zimmerman, vice president; and Shy Rosen, vice president in charge of eastern operations. Herman Gronauer has been named to succeed the late Stan Coumbe as manager of west coast operations.

▼

▶▶▶ Managership of the New York sales office of Diamond Alkali Company, Pittsburgh, has been given to *Henry B. Clark*, branch manager of the company's Boston sales office since 1946. He succeeds *Charles V. Douglas*, whose resignation became effective August 15. Mr. Clark joined Diamond in 1934 as a sales representative in the New Jersey territory.

▶▶▶ It has been announced that *Edwin C. Shaw* will succeed *V. L. Shaw* who has retired as president of the Perfecting Service Company, Chicago.

▼

▶▶▶ New advertising manager of Hardinge Company, Inc. (York, Pa.) is *William H. Shank*. He succeeds *R. C. Ferguson* who is now north central district manager. Mr. Shank had previously been a member of The W. H. Long Company, York advertising agency.

▼

WM. D. TAYLOR TO HEAD LUKENS INSPECTION DEPT.

William D. Taylor has been named superintendent of the inspection department of Lukens Steel Company (Coatesville, Pa.) and its divisions, By-Products Steel Company and Lukenweld. The inspection department, which heretofore had been associated with the metallurgical department of

Wm. D. Taylor

Lukens, is now a separate and distinct department under Mr. Taylor.

Mr. Taylor joined Lukens in 1936 as an engineer. Later he served as technical assistant in Lukens metallurgical department and then as assistant metallurgical engineer.

▼

WHITLEY MOORE ELECTED TIMKEN VICE PRESIDENT

Whitley B. Moore has been elected vice president in charge of sales effective August 1, succeeding L. M. Kline-sales office of Diamond Alkali Company's annuity plan after forty-three years of service.

Mr. Moore came to the company as a member of the factory equipment engineering department, later transferring to the Pacific coast in charge of our sales and engineering for all territory west of the Rocky Mountains. Later he served as manager of the Industrial Bearings Division and about three years ago was appointed director of all sales.

Mr. Klinedinst joined the company in 1905 and rose progressively through a number of positions in the shop until he was made general manager of the Industrial Division in 1924. He was elected vice president in 1930 and a director in 1934. He will continue to serve as director and sales consultant of the company.

NECROLOGY

GEORGE W. DOLAN

George W. Dolan, chairman of the board of directors of Mathieson Chemical Corporation, New York (formerly The Mathieson Alkali Works), passed away July 24 at the age of 46.

After joining Mathieson as a salesman in 1930, Mr. Dolan became manager of carbon dioxide sales in the following year and in 1935 was made assistant general manager of sales. He became assistant to the president of the firm in 1937, and the following year was named vice president. In 1940, Mr. Dolan was chosen executive vice president and on January 1, 1944, became president of the company. He was named chairman of the board in April, 1948.

During the last war Mr. Dolan was assistant district chief of the Chemical Warfare Service of the U. S. Army's New York Procurement District. He was a member of the National Industrial Conference Board and of the Advisory Board of the Marine-Midland Trust Company.

He is survived by his wife and a son.

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▶▶▶ The office manager and secretary of Jay Madden Corporation and its affiliate Madden, Reeve, Angel & Company, *Fred G. Wederholt*, was among those killed when a Royal Air Force transport plane recently crashed in England. Mr. Wederholt also was connected in various capacities with several other paper companies.

▼

DR. J. K. MOORE

Dr. J. K. Moore, supervisor in the cellulose products division of the Hercules Powder Company Experiment Station, Wilmington, Delaware, passed away July 13.

After working with the Westvaco

Chlorine Products Corporation in Charlestown, West Virginia, Dr. Moore joined Hercules in 1941 as a research chemist in the general research laboratories of the experiment station. Soon he was assigned to the cellulose products division where he remained until May, 1945. He returned to cellulose products this January as a supervisor. In his cellulose work, Dr. Moore assisted in preparing mathematical sections of a book, "Cellulose and Cellulose Derivatives."

Dr. Moore is survived by his wife, two daughters, and a son.

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▶▶▶ *Eleanor Nelson Milham,* wife of Allan B. Milham, passed away July 18 in a Kalamazoo, Michigan, hospital. Her husband was former president of the Bryant Paper Company, having held that position when the company was sold to Time, Inc. When the property was taken over by the St. Regis Paper Company, he relinquished that position. Mrs. Milham is survived by her husband and three children.

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▶▶▶ Superintendent of the Mt. Tom Division of the American Writing Paper Corporation (Holyoke, Mass.), *James N. Lister,* passed away July 29 at the age of 49. He had been employed by the firm for thirty years. His wife and two daughters survive

▼

▶▶▶ Former president of American Car and Foundry Company, New York, *Frederick A. Stevenson,* passed away July 29 at the age of 68. A member of ACF for more than forty years, he had served as master mechanic, assistant general manager, assistant vice president in charge of operations, vice president, senior vice president, and president. Surviving are his wife and a daughter.

▼

▶▶▶ Chief electrical and steam engineer of the West Virginia Pulp and Paper Company (Mechanicville, N. Y.), for the past fifty years, *Willard J. Barnes,* passed away July 21 at the age of 81. He was an honorary member of the American Institute of Electrical Engineers. Survivors are his wife and two daughters.

▼

▶▶▶ The organizer and director of the Livingstone Paper Company, *Harry E. Livingstone,* passed away July 19 in Toronto, Ontario. In 1900 he had become associated with the late Robert Currie, founder of the Dominion Paper Company, Montreal, and represented the firm in Ontario until 1909 when he organized the Livingstone company. He was made president of the Ontario Coarse Paper Council in 1931-32.

▼

▶▶▶ Superintendent of the Pacific Paperboard Company plant at Longview, Washington, prior to 1943, *Alexander O. Duve,* passed away July 18 at the age of 61. He had been employed by the Pacific company for twenty-two years. His wife, two sons, and a daughter survive.

▼

PAUL D. BRAY

Paul D. Bray, professor of pulp and paper technology at the University of Maine, passed away May 25 at his home in Orono, Maine.

Paul D. Bray

Born December 12, 1892, in Turner, Maine, the son of Frank E. and Alice S. Bray, Professor Bray received a B.S. degree in chemistry from the University of Maine in 1914, and a Ch.E. degree from the same institution in 1918.

Prior to his becoming a member of the University of Maine faculty, he worked as chemist for the Katahdin Pulp and Paper Company, as chief chemist for the Eastern Manufacturing Company in Brewer, and later became assistant superintendent of the pulp mill at the Eastern Manufacturing Company in Lincoln.

He worked as assistant in chemistry while obtaining his Ch.E. degree at the university and in 1923 became associate professor of chemistry at the University of Maine. Professor Bray served as professor and head of the department of pulp and paper technology from 1934-39, and in 1939 became professor of chemical engineering and pulp and paper technology and head of the Division of Pulp and Paper Technology, in which capacity he served until September, 1946, when this division became a part of the chemical engineering department. He had an important part in the development of the pulp and paper division of the College of Technology which has gained national recognition.

A member of the Summer Session faculty for several years, Professor Bray was head of the Summer School for Paper Mill Managers and Superintendents at the University of Maine for many years prior to the war.

Professor Bray was a charter member of the Technical Association of the Pulp and Paper Industry, and has given several addresses before this organization. He was also a member of the American Institute of Chemical Engineers, and the S.P.E.E. He conducted a large number of industrial and research projects through a period of years in the pulp and paper field, and several of his technical articles have been published in the *Paper Trade Journal.*

During the war Professor Bray served as air raid warden, first aid instructor, decontamination officer, and attended the first gas specialists course at the Officers' Candidate School at Amherst College. Always very active in community affairs, he was affiliated with the Boy Scout Troops and the Community Center.

As an undergraduate of the University of Maine, he was an honor student, and was elected to Deutscher Verein, honorary German Scholastic society, and to Phi Kappa Phi and Alpha Chi Sigma honor societies. He was a member of Beta Theta Pi social fraternity.

A great many faculty and university committees have had his assistance, and he served as treasurer of the University of Maine General Alumni Association.

Professor Bray is survived by his widow and one daughter.

▼

▶▶▶ A retired paper and pulp manufacturing executive, *Earl E. Young,* passed away July 29 reaching the age of 68 years. In 1920 Mr. Young had joined the Container Corporation of America, becoming credit manager of its Philadelphia branch. He was a staff representative for the National Paper Board Association from 1936 to 1940.

▼

▶▶▶ President and treasurer of the Franklin Paper Company (Holyoke, Mass.), *George C. Watson,* passed away recently. He had worked for the American Thread Company for twenty years until he bought the Bullard Thread Company in 1919 and operated this company until 1945. His wife and two daughters survive.

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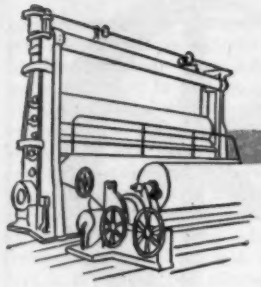
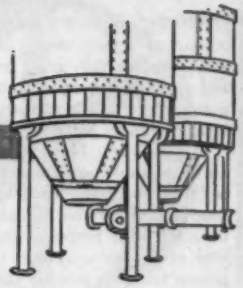


Practical SHORTS



Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Installation and Care of Chain-Driven Bucket Elevators

Inspect Sprockets and Chain—When sprocket teeth wear, do not build up by welding; replace. Maintain shafts parallel, level and in line—also vertical castings plumb. Correct any interference between chain or buckets and casing. Maintain tightness of keyed wheels. Lubricate shaft bearings frequently, also supporting idlers on inclined units (Figure 1).

Inspect chain regularly for wear on the sidebar inner faces. Wear here indicates misalignment. Look also for pins loose in their seats, missing cotters and roller wear. Lubricate according to directions provided for your particular chain.

Replace Sprockets When Replacing Chain—Never use new chain on old sprockets, or new sprockets with old chain.

Keep Securely Bolted—Be sure by periodic check that buckets are tightly bolted to the chain (Figure 2). Loose buckets break off and damage machinery.

Replace Worn and Damaged Buckets—You won't save by keeping worn or damaged buckets on the job. When buckets are damaged, wear out at the lip, or begin to tear at the corners, they should be replaced (Figure 3). You save headaches and money in the long run by observing this practice.

Keep Clean—Cleanliness pays in buckets, too! Make sure they are discharging cleanly and that the material is not building up. Periodic cleaning should be done regularly (Figure 4).—*The Rex World*, CHAIN BELT COMPANY.

▼

On the Maintenance of Your Drives

A perfect functioning drive on the paper machine is easy to obtain and easily maintained. This being the case, a perfect drive is often forgotten until it causes trouble. Let's look at the various component parts forming a drive.

1. *Belts:* On a properly designed drive, flat belts should give years of trouble-free operation. Use belting of ample size to transmit required power.

Put flat belts on under good but not excessive tension. With excessive tension, shift deflection will result, giving bearing and coupling trouble. Use wider belts if necessary and keep their speed up to where they work efficiently.

If a change is made to a cone pulley drive, use cones with the same taper. Offset cone pulleys properly for, if you don't, the belt will ride the shifter and wear edges of the belt.

Keep oil away from rubber belts and store belts in dry, cool places away from light when not in use.

Repair any minor injury at once because it will soon become a major one. Re-cement edges and ends of belt laps whenever they show signs of opening, and run the belt in such direction that the tip of the lap on the outer ply trails. Use belt dressing sparingly.

Don't use belt too thick for the diameter of the pulley on which it operates. Don't tolerate slippage—investigate the cause and correct at once.

On V-belts, maintain proper alignment because misalignment will cause undue wear on the belt sides. Proper tension must be maintained through adjustable motor mountings or in case of fixed centers, with idler pulleys.

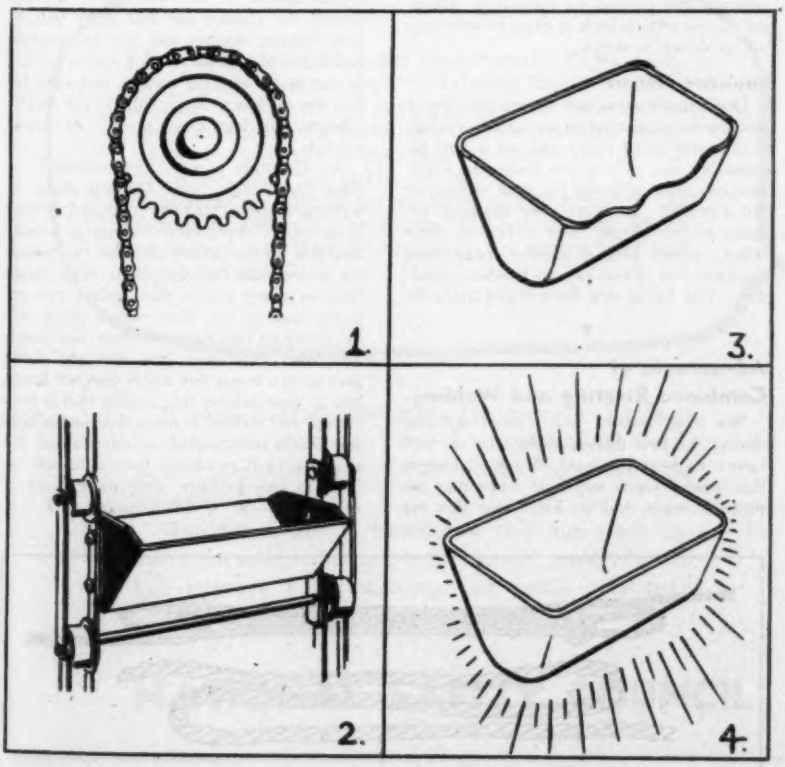
Don't use a belt dressing on V-belts. Their operation requires friction between the belt and the sheave. If belt slippage is encountered, the drive is improperly designed.

When replacing V-belts on a V-belt drive, install all new belts because it is difficult to match new belts to old belts, the old belts having stretched an unknown amount. Never pry a belt onto a sheave.

2. *Clutches:* Use care in striking in clutches, especially after a long shutdown. After a shutdown, oil has drained from the bearings and the journals, giving a tremendous increased starting load. Start slowly and keep clutches in proper adjustment. Clutch slippage very soon ends the useful life of a clutch.

3. *Gears:* It is extremely important that gears be mounted properly, especially spiral bevel and hypoid gears. They must be in absolute alignment and with proper backlash in accordance with manufacturer's instructions. Noise and heat thoroughly attest the presence of improperly mounted gears and broken teeth and fast wear soon result.

Lubricate them properly. As mentioned



previously, we have actually had to shovel oil out of a gear case. On open mortise gears, replace thin gears before they break and cause an expensive shutdown. Mortise gears are getting harder and harder to get. Here is another place for that spare.

4. *Couplings:* Flexible couplings are not universal joints. Alignment of shafts should be made with the same care as for solid couplings. Flexible couplings should be installed with proper clearances. Lubrication of flexible couplings is too often forgotten and is a primary cause for coupling failure. Check it periodically.

Maintain proper alignment of jaw couplings, for misalignment will wear centering rings, giving a slipping shaft. Keep jaw couplings tight, otherwise a ruined keyway and shaft extension will result. Check the drives periodically for misalignment caused by settling of foundation.

5. *Bearings:* Check the tail bearings and inshaft bearings for wear and misalignment. Here is a good place to institute that bearing record to show life expectancy. Don't over-lubricate the loose pulley bearing or the high-speed shaft bearing—it's hard on the belt.

6. *Inspection:* A systematic schedule of periodic drive inspection should be maintained. Belts should be inspected regularly and protective care taken of them. Lubrication should be periodic, correct and not haphazard.

In the foregoing, we have attempted to touch on the main points of the paper machine where preventive maintenance can be especially profitable. The remarks have been necessarily brief since discussion and details concerning any one of the points could run into volumes. Every maintenance man is well aware of most of the factors on which we have elaborated. We have repeated them merely to magnify their importance.

In taking care of the paper machine, constant attention must be paid to all details, if trouble is to be stopped before it is started, for the failure of a bearing can shut down a half-million-dollar machine.

Paying attention to the major factors and ignoring the minor factors soon changes a minor irritant to a major trouble. It's like shoeing a horse with the aid of a nose twitch. The horse concentrates all his attention on his nose and ends up with a pair of new shoes which he didn't want in the first place.—Sam T. Weber, from *The Messenger* (No. 247, April, 1948), published by THE BLACK CLAWSON COMPANY; this item also has been copyrighted and published in *Preventive Maintenance in Pulp and Paper Mills,* compiled by THE AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION.

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The Sheepshank

The sheepshank is intended to shorten a rope for temporary use only. Carefully tied and drawn up tight, it is fairly reliable under a steady pull. But to make it secure for any length of time, both loops should be "stopped" to the standing parts. (An ordinary "stopping" is made with marline or spunyarn. It consists of several round turns about the parts to be fastened together—the ends finished off with a square knot.)

To Tie: Form an S loop as shown in the accompanying top diagram. Then with one free end of the rope make a half hitch and slip it over one of the loops. Tighten. Repeat procedure with the other loop.—*Useful Knots and How to Tie Them,* PLYMOUTH CORDAGE COMPANY.

▼

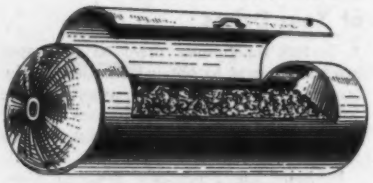
Take Care of Small Castings

Don't treat small castings like poor relations. Large castings that need preheating before welding are not the only ones that should be cooled slowly and carefully. Small castings are subject to internal strain just as much as large ones. You'll find that the most convenient and efficient way to cool small castings slowly is in an annealing bin.

How to Make It

You can make an annealing bin in just a few minutes time from an old cylindrical storage tank. Or you can use old range boilers, and old tanks from a hot water heater. When these items are not available, you can use your welding blowpipe to construct a bin from sheet metal. The size and shape will depend upon the materials you have on hand.

With your cutting blowpipe, cut a section out of the side of the tank. Be sure to observe the approved safety practices for



welding and cutting on containers. Hinge the cut-out section back in place to serve as a lid, as shown in sketch.

Insulation Material

Don't throw away the old asbestos paper you use to protect large preheated castings. Tear it into small pieces and put it into the annealing bin. The paper makes an excellent insulation material for slow cooling of hot castings. It won't cost anything because you've already used it two or three times. Slaked lime is another inexpensive insulator that is also easy to handle.—*Linde Tips,* THE LINDE AIR PRODUCTS COMPANY.

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Advantages of Combined Riveting and Welding

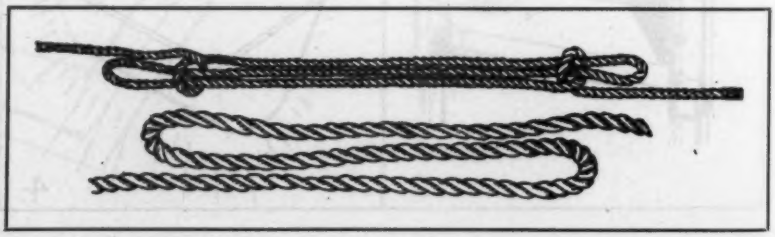
We have learned much about welding during the past three decades, but we still have considerable to learn. We at least know that welded joints will hold when they are properly made, and we know that they are treacherous when they are improperly made. This writer has had experience with both types of welded joints—those that hold, and those that let go. One of those that let go, unfortunately, caused the loss of a man's life.

The principal objection to the welded joint in the "old days" was the so-called "personal factor." That objection has been largely eliminated now, but it still exists. In riveted joints the personal factor is not present to the same extent. Besides, the welded joint does not lend itself so readily to easy inspection and testing. It is comparatively easy for the welder to "cover up" a poor job of welding.

Welding has very important advantages, to be sure. Thus in the making of tanks there are two outstanding benefits: first, a properly made welded joint is stronger, and, second, a welded joint is leakless and calking is unnecessary.

As for combined riveting and welding, the question is often asked, "Will a combination of riveting and welding work in unison or will the weld which unites the metal in one piece take the entire load and will the elastic limit of the joint be reached before the rivets begin to work?" This question can hardly be answered positively because so much depends upon the nature of the weld. If properly done, there can be but little question that the weld and riveting will act in unison, but there is no telling in advance or possibly even after the welding is done that the two will work in unison, and we must "take a chance" just the same as we are doing day after day even with riveted work. Riveted work, you know, requires a factor of safety in nearly all engineering practice. By carefully annealing the welding after it is finished it is quite possible that the welding and riveting will act in unison. If the welding is not annealed, the chances are that there will be some internal stresses and both the riveting and the weld will be stressed somewhat due to the initial welding stresses and even before the load is applied. This is not merely "theory"—it has been proved in actual practice.

An advantage possessed by combined riveting and welding over riveting alone, or welding alone, is that the combined method gives us a "duplication" which is usually desirable for the same reason that two pumps on boilers are desirable, two main steam lines in power plants, two boilers, two engines, and so on. Even nature plays safe by giving us two ears, two eyes, two lungs, and other duplicates. Just why she didn't give us two hearts this writer does not know, but he does believe that a joint that is both riveted and welded is more dependable than one that is only riveted or only welded. No doubt we will eventually have a definite answer to this problem after more years of experience.—W. F. SCHAPHORST, M.E.



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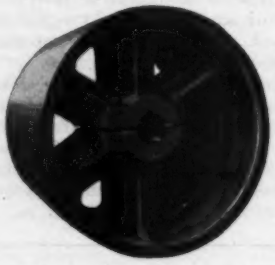
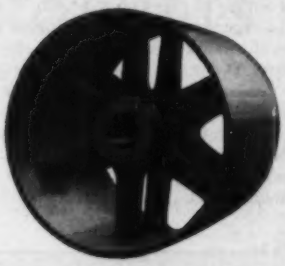


Extra heavy conveyor pulley



Double arm pulley

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The Modern Paper Machine Drive

G. E. PLAISTED, Paper Mill Division Industrial Engineering Divisions General Electric Company

Abridgments in this section are from papers presented at the annual meeting of the **American Pulp and Paper Mill Superintendents Association** held in New Orleans, Louisiana, May 19-21, 1948.

Paper and paper products have been to industry what high octane gas has been to aviation. The paper industry has jet propelled our national standard of living to a level enjoyed only on this continent. World War II would have stopped in sixty days had the supply of paper been cut off. World peace is dependent upon its continued advancement. Today the paper industry is the fourth largest in kw consumption and 77 per cent of the world's production is in the United States and Canada. Such growth was made possible by the aggressive performance of paper mill superintendents and their engineers in papermaking production.

Although stock preparation and refinement processes have been subjected to many changes to obtain fibers most suitable for sheet formation, the consistency of weight —one of the most important of paper production qualities—is still dependent upon the ability of the paper machine to maintain a constant over-all speed. Means must be available for holding a definite speed relation between sections to compensate for the inherent change in the sheet length that occurs as it progresses through the machine. In part, these are the requirements imposed on a paper machine drive; the problems connected therewith can be solved only through the sincere co-operation of electrical and mechanical engineers with paper manufacturers.

Today there are two major types of drive:

1) The mechanical or line shaft drive (Figure 1)

2) The sectional drive (Figure 2)

Both of these have gone through extensive redesign during the past 28 years as the result of intense study of the problems involved. Both have made important improvements.

Until 1919, the line shaft drive was universally used. That this type of drive requires cone pulleys, large flat belts, clutches and right angle gears is well known. In 1919, it was recognized that to satisfy the demands for increased production the paper

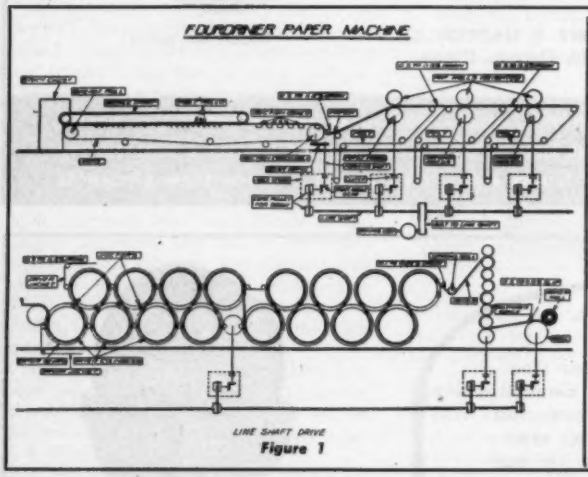


Figure 1

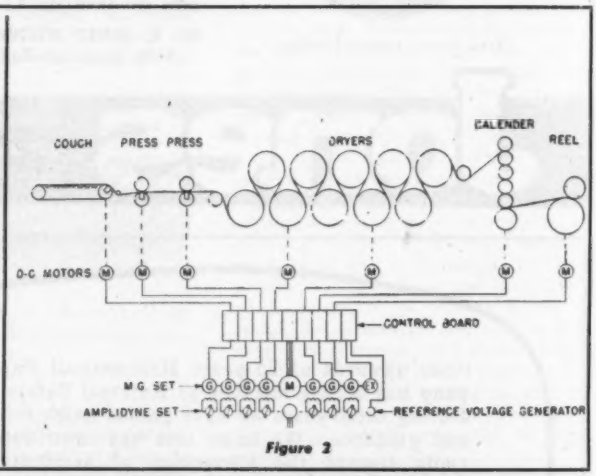
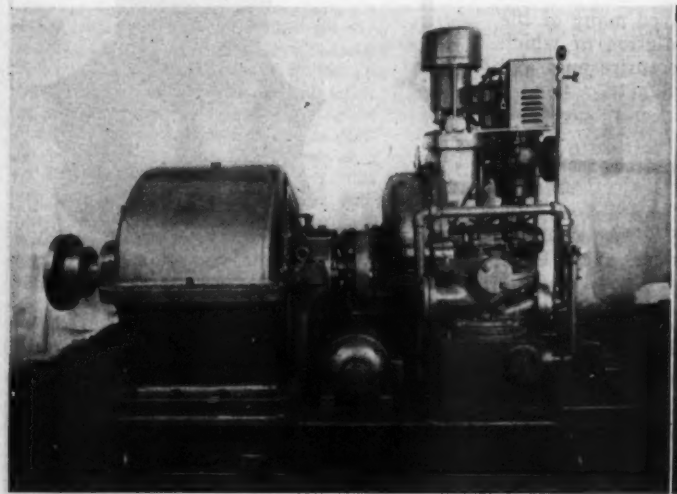


Figure 2



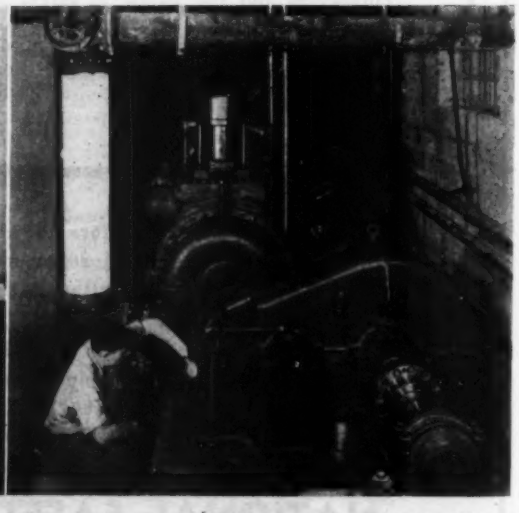


Fig. 3 (left)—G.E. mechanical-drive steam turbine and double-reduction gear. This 700-hp. turbine operates at following steam conditions: 180 psi (g), 480 ftt, 25 psi (g). Leftside view. . . . Fig. 4 (right) Dorve 300-hp. mechanical-drive steam turbine and gear direct-connected in backline of Beloit paper processing machine. There are no clutches between line shaft and the machine, which is located on floor above turbine which is governed by preset-speed control unit located alongside paper machine. General view

machine design had to be changed. Paper manufacturers were faced with deciding whether machines should be made wider or be designed for higher speed. The decision was to go to higher speeds. The mechanical parts of the line shaft drives in use then were not suitable for the higher speeds. The electrical industry saw and accepted the challenge. The first sectional drive was built. Since that time the competition has been very keen between the two types of drive. Such healthy competition has spurred engineering ingenuity toward greater achievement, and ever improved production equipment has become available for the paper industry.

Drive Requirements

To satisfy the requirements of any paper machine, either type or drive must make provisions for:

1) The selecting and maintaining of over-all machine speed. The speed selected is according to the operator's desires but the maintaining of the speed is a quality requirement.

2) The starting of each section at a controlled rate of acceleration as demanded by the section inertia or production requirements.

3) The stopping, individually or collectively, of sections with controlled rates of deceleration.

4) Slow speed operation of each section individually to facilitate inspection, wash up or clothing change.

5) Draw adjustment, which is the speed relation between sections. The evidence of such adjustment must be fast, the results must be accurate and the ability to accomplish it must be convenient.

6) Slack take-up or a momentary speed change to take up the slack introduced between sections while threading.

7) Reversing of some sections to facilitate removal of broke or plugs.

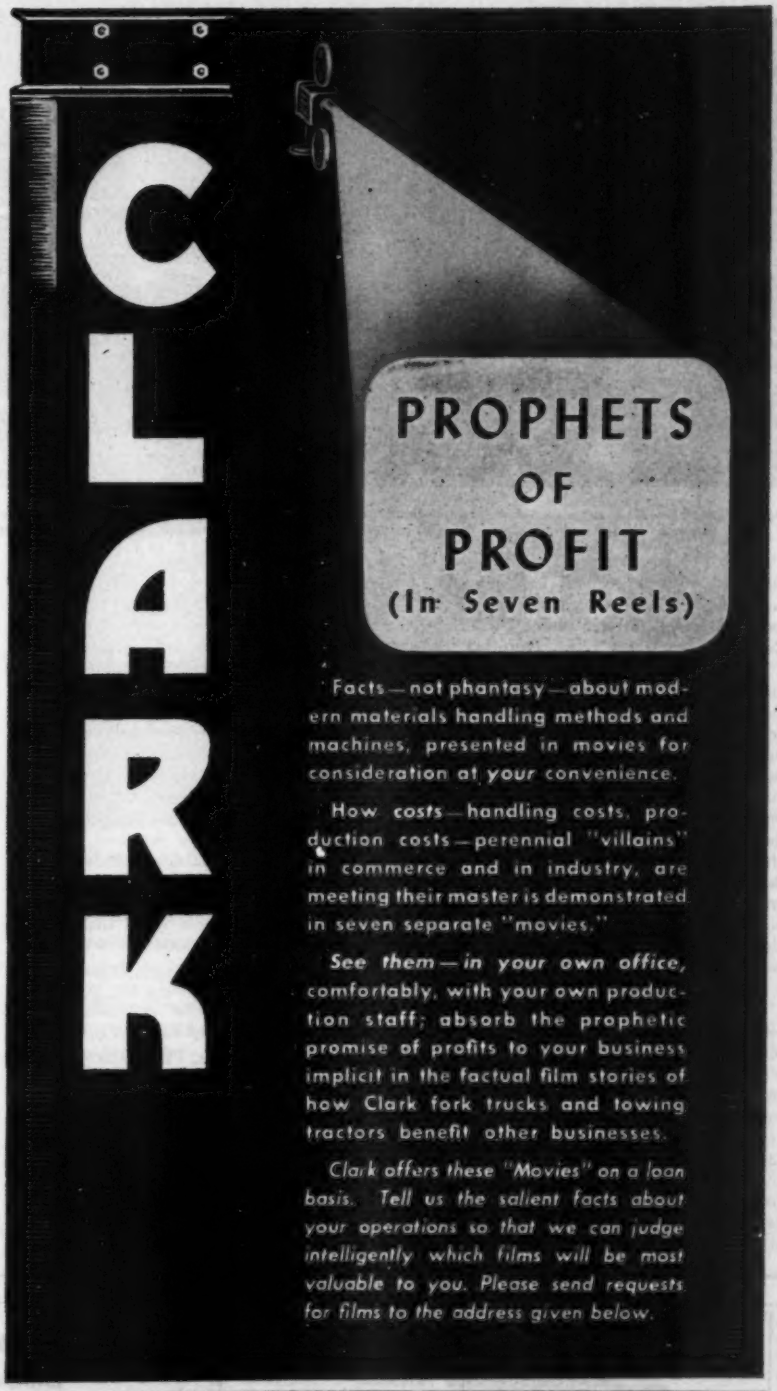
8) A flexibility in the possible arrangement of equipment to most efficiently utilize floor space and make maintenance easier.

To accomplish such performance requires precision equipment with control stations located at the most convenient operating points.

Line Shaft Drive

The line shaft has been driven by water wheels, steam engines or turbines, and by electric motors, dependent upon the economics of the installation. Today, the choice of power has been changed only in that it is tempered by the accuracy of the speed control that is desired and is available. With a line shaft drive, the power equipment can only determine the over-all machine speed. The speed relation between sections (draw) is entirely dependent upon the performance of flat belts operating on cone pulleys.

The line shaft drive has gone through revolutionary changes. Bearings have been changed to the antifriction type, belts and pulleys have been redesigned for higher speed and greater power, clutches of the pneumatic or hydraulic type are now in use and right angle gears of improved design have been applied. Thus have friction losses been reduced. Electric motors with control to put a definite amount of power into a section are being installed at important critical sections to reduce the belt load-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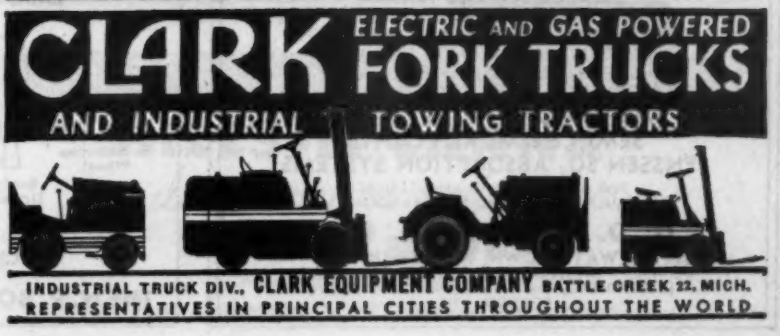
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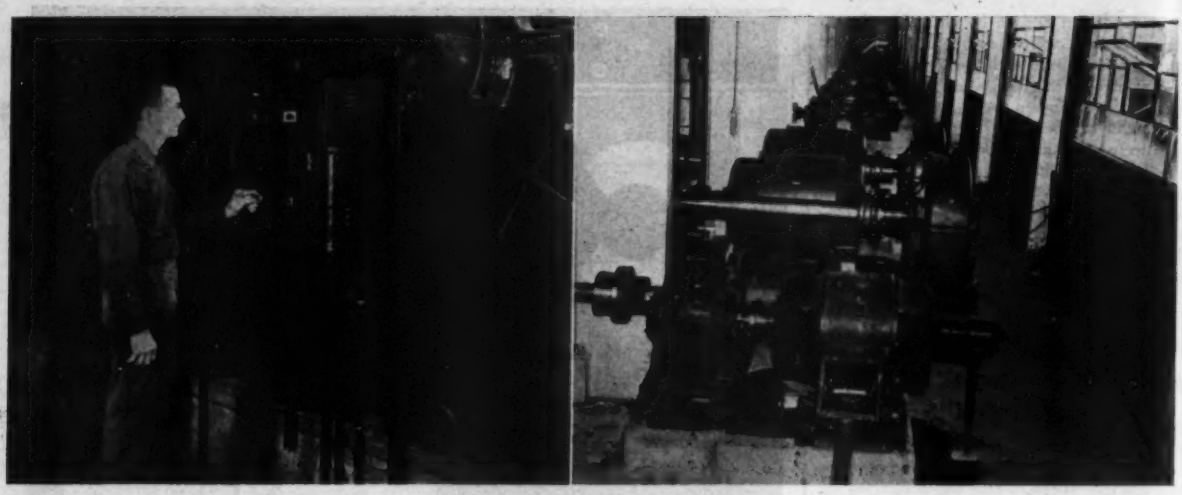

Fig. 5 (left)—Operator at preset-control unit which governs speed of Dorvo 300-hp. mechanical-drive steam turbine connected in backline of Beloit paper processing machine. Turbine located in basement and paper machine on first floor directly above. . . . Fig. 6 (right)

ing. All of these features have been improved in the attempt to satisfy all of the requirements enumerated above. The unit furnishing the power is so controlled that a selected speed can be maintained or adjusted at will. The clutches provide a means of starting or stopping each individual section. Present clutch design provides for gradual engagement to minimize any sudden load being applied to the line shaft. Such sudden application of load requires immediate compensation by the control of the driving unit. Slow speed operation is also accomplished by partial engagement of the clutch or by using the helper motor, if one is available, at the particular section involved. Draw adjustment is made by changing the position of the belts on the cone pulleys and today is accomplished by a motor driven belt shifter.

The modern drive of a line shaft employs either an adjustable speed turbine or an adjustable voltage generator supplying power to a d-c motor. Precision speed control of these two types of power has been developed to the greatest degree of accuracy. The control for the adjustable voltage generator and d-c motor compares the speed of the motor indicated by a pilot generator direct connected to it with a selected portion of an accurately regulated reference voltage. A speed variation of a small fraction of a per cent is amplified to force a speed correction. Since this control is the same as that used with one section of a sectional drive that will be discussed later, the precision control of an adjustable speed turbine as applied to a line shaft drive will be discussed here. An adjustable speed turbine (Figure 3) is particularly adaptable to this type of drive because additional process steam is economically made available to be used in the papermaking process. Steam taken at boiler pressure is passed through the turbine and extracted at a pressure required for the process. Power taken from the steam by the turbine drives the line shaft. A reduction gear (Figure 4) is direct connected to the turbine and its low speed shaft drives the line shaft either directly or through belts. The speed control of such a unit is accomplished by impressing the voltage of a direct connected pilot generator on an accurate solenoid. The solenoid controls an electrically operated pilot valve which supervises the main steam valve to hold speed. An operator's panel (Figure 5) mounted on the tending side of the paper machine, remote from the turbine, provides start, stop and over-all speed control. Push buttons for start or stop and a small hand dial for speed selection are contained in one small cabinet that can be conveniently mounted at that spot best suited to the operator. The speed dial can be preset and when the start button is pressed, the turbine will accelerate, at a definite rate, until the desired speed is reached. If the speed dial is changed during operation, the resulting change is made at a controlled rate. This control is doing an outstanding job. Under steady state conditions it will hold speed of the line shaft with an error of less than 0.1 per cent.

Sectional Drive (Figure 2)

The second type of drive for a paper machine is the sectional type. When the electrical industry accepted the challenge to provide a high speed drive, it chose to supply an individual motor for each section. This eliminated the long line shaft with its cone pulleys and belts, clutches and its right angle gears. Instead, at each section an individual power unit connected to the section in driving shaft was furnished (Figure 6). With the mechanical tie between sections (the line shaft) removed, some other means of maintaining section speed was necessary. A speed regulator for each section was furnished. The speed regulator became the pulse of the drive. It still is.

The modern sectional drive is the multiple generator powered electronic-amplidyne controlled system (Figure 2). As implied by

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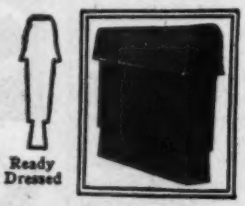

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the name, a separate generator with its individual amplidyne exciter, a driving motor and an electronic control panel is provided for each section. The terms "electronic" and "amplidyne" identify not complex delicate systems but tried and proven industrial devices. Electronics were considered as far back as 1923, but at that time tube life was questionable and as dependability and continuity of service were inviolate, the project was shelved. Today, the developments during the war have been taken advantage of, together with the advancement in the design and manufacture of tubes such that with periodic checking of tube conditions, reliability is assured. The amplidyne is merely a special design of d-c machine, sensitive to changes in excitation in terms of milliamperes instead of amperes, and whose speed of response to any change is extremely fast, thus making it an ideal controlling unit. The combination of the two permits the control of a large power unit with micro-watts of control, thus eliminating large resistors and rheostats and their space taking and heat dissipating disadvantages. In combined form they provide a separate unit of power for each section unaffected by disturbances of other sections. Each section then is a power unit with finger-tip control and one small cabinet on the tending side, at the point where observations are made, convenient for making corrections.

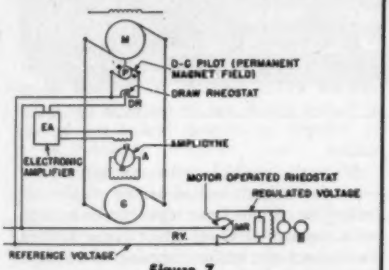

Figure 7

Figure 7, a manually set, motor operated rheostat (MR) on the master operator's panel selects a portion of an electronically regulated reference voltage to establish the over-all speed of the machine. The pilot generator (P) direct connected to each section motor develops a voltage proportional to the speed of the motor. This voltage is compared with that selected on the speed rheostat. The comparison is made in the electronic preamplifier (EA) and any difference is, after amplification, impressed on the amplidyne field in the proper direction to make the desired correction in speed. A manual rheostat (DR) is inserted in the pilot generator voltage circuit such that only a portion of its voltage is used and thus draw can be adjusted. For the maximum convenience of the operator, water-tight operator's panels are located at each section with an ammeter to indicate the load, a draw rheostat to adjust the draw and push buttons to enable the operator to start, stop, take up slack, run slow or reverse, as may be required by the particular section. This modern type of drive has been made possible by the use of electronics and the amplidyne.

To be considered modern, any equipment must have advantages over its predecessor. This drive has many. It not only satisfies

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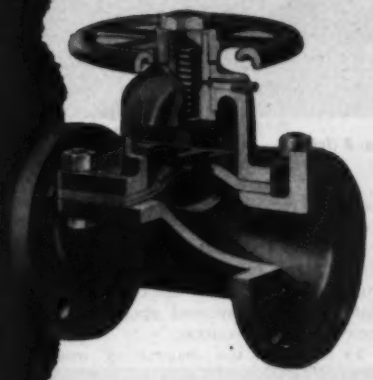

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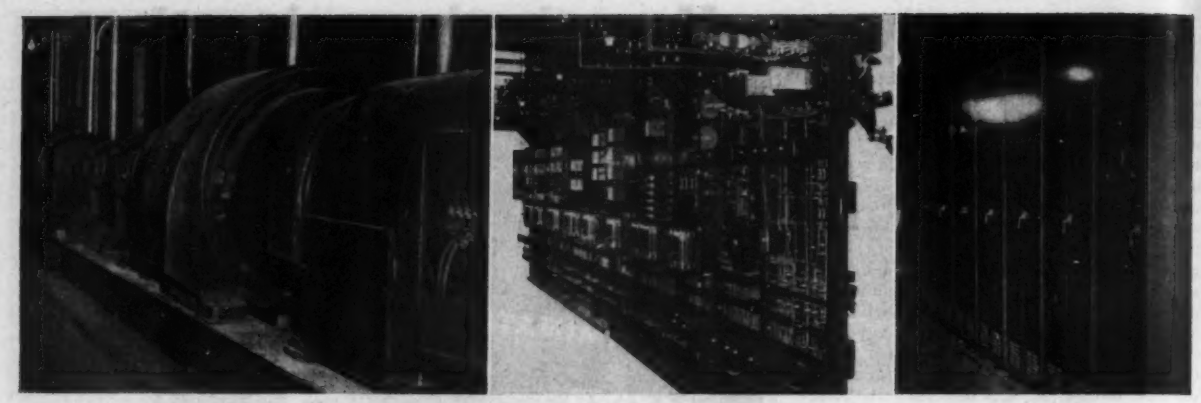

Fig. 8 (left). . . . Fig. 9 (center)—G-E main control panel for sectional paper machine drive. Approximately 8 ft., 6 in. high, 24 in. wide, 6 ft. 3 in. deep. Closeup leftend view. . . . Fig. 10 (right)

the eight requirements previously enumerated, but improves on them. Its predecessor was the single generator system which furnished power to all of the section motors from one generator. It had certain features that have been improved upon. Consider these eight requirements:

1) Selecting and maintaining machine speed

The voltage of one generator in the single generator system establishes the machine speed. It is varied to adjust machine speed. Because motors of different ratings do not change speed equally with the same voltage change, field weakening on some is required. Field weakening reduces torque per ampere. Therefore, for constant torque more amperes are required when the field is weakened. For wide speed ranges, the magnitude of this current increase may require derating of the motor.

With the multiple generator system, the voltage is reduced only that amount necessary to obtain speed required. Torque per ampere is constant, derating is not necessary.

2) Starting

With the single generator, starting of each section is accomplished by manual rheostats or by separate starting generator. With the former, each start puts a shock load on the main generator which is reflected on the other sections. With the latter, the shock occurs at time of transfer from starting generator to running generator, and only one section can be started at a time. With the former, rate of acceleration is determined by operation of the manual rheostat. With the latter, rate of acceleration is established by the rate of build-up of the starting generator voltage and is the same for all sections.

The multiple generator system provides for starting any or all sections at one time. Each section is accelerated at a predetermined rate established to be that best suited to the inertia of the section.

3) Stopping

In stopping the motors with a single generator system, dynamic braking can be applied which develops its greatest effort at higher speeds and decreases as the speed is reduced; or friction brakes can be installed.

With the multiple generator system, deceleration of each section can be evenly controlled by current limit regenerative braking with constant braking effort being applied throughout the entire stopping speed time. No external brakes are required.

4) Slow Speed

If rheostat starting is provided, any or all sections of a single generator system can be run slow at a time by running on the first or second point of the starter. With a starting generator, only one section can be run slow at a time.

With the multiple generator system, any or all sections can be run slow at a time and the speed can be adjusted to best suit that required for each section.

5) Draw adjustment

Today the electronic amplidyne control would be used with either the single generator or the multiple generator systems. With the former, the field of the motor is weakened to increase the speed while with the latter, the section motor field is fixed and the generator voltage is adjusted to make the correction. With the latter, therefore, constant torque per ampere is maintained and while both are fast and accurate, the multiple generator is a little faster. In either case, the change is immediately evident and is not reflected on other sections.

6) Slack take up

Again both types of sectional drive provide this feature, but its performance is evidenced quicker with the multiple generator system.

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7) Reversing

This feature also is included with either the single generator or multiple generator type of drive, but the amount of control necessary with its associated interlocking is reduced with the multiple generator system. Reversing is not provided on a line shaft drive unless a helper motor is applied on the particular sections involved.

8) Flexibility of arrangement

The single generator with its starting generator must be arranged as a large M-G set of adequate capacity to supply power for the entire machine. Its size may limit the speed to 750 or 900 rpm. This means one large heavy set. The multiple generator system, with each generator of the capacity required for one section only (Figure 8), can almost always be designed for at least 1200 rpm. The units can be mounted on several bases such that the weight of each becomes simpler to handle. It is also possible to have some of the smaller sets made up into 1800 rpm units. They can be arranged to best suit the available space. A single generator panel has heavy interconnected bus structure (Figure 9). It requires control wires in large numbers for necessary interlocking of sections (Figure 10). It is normally of the open type. The multiple generator system has a separate, enclosed, control panel for each section, requiring no interconnected bus structure and a relatively few control wires. A separate power source for each section has resulted in decreased installation time and expense, and minimizes maintenance and trouble-shooting problems.

In discussing the line shaft drive, a turbine was described as the power unit. An advantage was given for this unit in that it provided a means of economically obtaining process steam. This is an advantage that is also available with the sectional drive and to a greater degree. With the line shaft drive, as the speed is reduced the shaft horsepower reduces and even though the steam rate increases, the available steam at the low speed is less. If a turbine is made a part of the multiple generator set, the steam flow can remain constant and any excess power to be recovered can be pumped back into the mill power supply through the synchronous motor that normally would supply power for the set. Thus is made possible a constant or adjustable steam flow for processing regardless of power requirements of the paper machine.

The electrical industry's target has been precision of speed, continuity of performance, convenience and simplicity of control, and at an installed cost that shows a slight advantage in favor of the sectional drive. This advancement could only be realized with the full co-operation of the paper industry.

Abridgments in this section are from papers presented at the annual meeting of the Technical Association of the Pulp and Paper Industry held in New York City, February 23-26, 1948.

Phenol-Furfural Varnishes for Laminates

HARRY KLINE, Manager and Technical Director, Phenolic Plastics Div., Reichhold Chemicals, Inc.

Resin industry technicians have long been aware of the dual difficulties of short supply and lack of uniformity in cresylic acids. Consequently, a great deal of experimental work has been carried on during the past ten years in an attempt to use chemically pure phenol which is far more available than cresol, as the starting raw material in the production of laminating varnishes. In many applications, the use of phenol presented no difficulties whatever. It proved impossible, however, even with straight phenol-formaldehyde varnishes made under the most ideal conditions and using the best technical knowledge of the industry to produce laminates equivalent in dielectric strength, power factor, etc., to those produced with cresol.

The best the resin industry was able to do until very recently was to produce so-called modified phenol varnishes by adding a diluent with good dielectric properties to the phenol resin. Such varnishes have been on the market since around 1940. The diluents added to such varnishes, however, are not resins and have no bonding properties. Consequently, these modified phenol varnishes were a compromise and did not yield the results possible with a 100 per cent

Table 1—Electrical Properties OW 0.075-inch Paper Panel

Dielectric strength, step by-step test, volts/mil	647
Power factor, 1 million cycles	0.0358
Dielectric constant, 1 million cycles	4.62
Loss factor, 1 million cycles	0.165
Volume resistivity, megohm-inches	2.11×10^6

Table 2—Mechanical Properties of 0.15-inch Paper Panel

Tensile strength, lengthwise, p.s.i.	15,750
Flexural strength, lengthwise, p.s.i.	21,700
Modulus of elasticity in flexure, p.s.i.	1,279,000

Table 3—Mechanical Properties of 0.5-inch Canvas Laminates

Tensile strength, lengthwise, p.s.i.	14,650
Tensile strength, crosswise, p.s.i.	14,450
Flexural strength, lengthwise, p.s.i.	25,500
Flexural strength, crosswise, p.s.i.	23,650
Modulus of elasticity in flexure, lengthwise, p.s.i.	704,000
Modulus of elasticity in flexure, crosswise, p.s.i.	711,000
Notched izod impact, lengthwise-side, foot-lb./in. of notch	2.41
Notched izod impact, crosswise-side, foot-lb./in. of notch	2.50
Notched izod impact, lengthwise-face, foot-lb./in. of notch	4.37
Notched izod impact, crosswise-face, foot-lb./in. of notch	4.38
Compressive strength, p.s.i.	48,800
Bonding strength, lb.	2,000

phenol resin since the bonding and other properties were affected by the inert diluent. In spite of this, millions of pounds of such modified phenol resins have been used due to the shortage of cresol varnishes.

The hope of resin technicians, however, has always been to develop a 100 per cent phenol-base varnish which would prove as good as a straight cresol varnish in every respect . . . producing laminates as good, both electrically and mechanically, as those produced with the best cresol varnish.

In spite of the tremendous amount of research carried out in this field, as evidenced by the number of patents, it was discovered, via a survey conducted in the laminating field that no phenol-furfural laminating varnish was commercially available. Some laminators, however, were adding furfural to varnishes as a modifying agent, while others had formerly used phenol-furfural varnishes which they themselves had produced. A number of these laminators expressed a desire to try out a phenol-furfural laminating varnish, provided it could be demonstrated that such a varnish possessed the properties they required.

After making this survey about three years ago, the author's company started experimental work, utilizing furfural along with phenol, to produce a varnish possessing the properties required by the laminating industry. While it was hoped to develop a 100 per cent phenol resin which would provide as good dielectrically as a 100 per cent cresol varnish, first had to be determined just what type of varnish it was possible to make by using furfural in the resin reaction. A number of varnishes were produced, and laminates prepared and tested for electrical and mechanical properties. Certain leads indicated the possibility of securing a varnish of good dielectric properties, and these leads were diligently followed. In addition to obtaining the desired dielectric properties, it was desired to develop a varnish which was practical from a production standpoint . . . a varnish which would dry in the treating machine in approximately the same time and under the same temperature as a good cresol varnish, and one which would cure in the press under similar conditions.

The product finally evolved is a 100 per cent phenol-base varnish which produces laminates which are as good electrically as those produced with the best 100 per cent cresol varnishes now on the market and somewhat better mechanically. Marketed as No. 5040 Plyophen, hundreds of thousands of pounds of this varnish have already gone into the production of dielectric laminates used in the manufacture of electrical, telephone, radio and other equipment.

Typical properties of both paper and canvas laminates made with this resin are listed in Tables 1, 2 and 3. Tests of laminates made with a good grade of 100 per cent cresol varnish against laminates made with the new resin show that the latter possess fully as good electrical properties, somewhat better mechanical properties, and equal water resistance.

1. The phenol (C.P.) is used in its manufacture, and since phenol is more readily available than is cresol, the laminator is assured of an ample supply, which will not be affected by the recurring shortages of cresol.

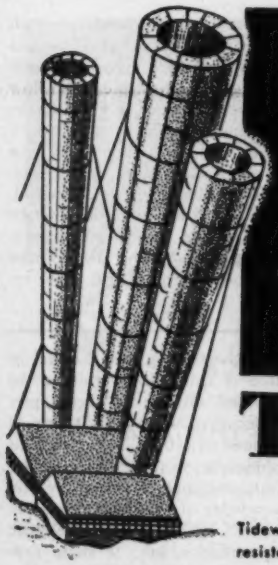
2. Likewise, because the raw material involved is C.P. phenol, rather than a mixture of cresol isomers, the properties of which may vary from time to time, the result is a more uniform product.

3. The price on a solids basis is generally less than the prices of cresol laminating varnishes, since special cresols usually cost more than C.P. phenol. In addition the varnish, sold at 75 per cent solids, is in the same viscosity range as the usual 60 per cent solids content cresol varnishes, so that there is likewise a saving on alcohol.

4. Better mechanical properties, especially tensile strength and Izod impact strength, are generally obtained.

5. There are indications that the electrical properties of impregnated materials suffer less on storage before curing than is the case when cresol varnishes are used.

6. There are also indications that the laminates have less tendency to warp than do laminates made with 100 per cent cresol



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varnishes. This may be due to the unique flow properties characteristic of phenol-furfural varnishes which probably tend to prevent as many stresses in the material.

7. As in all straight phenol varnishes, there is less cold flow than is the case with cresol varnishes. Cresol varnishes contain large amounts of o-cresol and p-cresol resins which react slowly and tend to act as plasticizers, resulting in more cold flow.

8. Phenol varnishes generally afford about 10 per cent better treating machine yields than is possible with cresol varnishes. By this, is meant that there is less volatilization in the drying ovens where the solvent is removed from the impregnated materials and the resin advanced to the proper stage. Here again, the lower yields with cresol are due to the slowly reactive o- and p-cresols, which form resins which are more readily volatilized. The greater yield afforded by phenol-furfural resin naturally tends to reduce the ultimate cost of this varnish.

A decided advantage of the resin over the modified phenolic varnishes is that it is a 100 per cent phenol resin, whereas the modified phenolics have appreciable amounts of inert and nonthermosetting materials added to improve electrical properties. While their addition does achieve this result, it is at the expense of other properties which are likewise important to the laminator.

The resin is dark brown in color, instead of the usual yellow of the cresol varnishes. As a consequence, laminates made with it also turn out dark brown. Inasmuch as purchasers have come to expect yellow laminates, it may take them a little time to become accustomed to this difference in color, although dark brown would seem offhand to be as acceptable from a color standpoint as yellow. For the manufacture of black laminates, the new resin is available with a black dye added.

A 6-mil alpha-cellulose paper was impregnated with the phenol-furfural resin, so as to contain 50 to 52 per cent resin and 5.5 to 6.5 per cent volatiles (volatiles were determined by drying a small sample sheet of the impregnated paper for 10 minutes at 160 C. and determining the percentage loss in weight).

Two panels, one of approximately 0.75 inch thickness and the other of 0.15 inch thickness, were cured together in a hydraulic press for 45 minutes, using 100 pounds steam and a pressure of 1,200 p.s.i.

Electrical and mechanical properties of these paper panels are listed in Tables 1 and 2.

More detailed mechanical tests were conducted on canvas laminates made with 8-ounce duck and the phenol-furfural resin, and impregnating to about 48 to 49 per cent resin and 4 to 5 per cent volatiles.

Curing time for a sheet 0.5 inch thick was 45 minutes, using 100 pounds steam and a pressure of 1200 p.s.i. Mechanical properties of these canvas laminates are listed in Table 3.

In checking the electrical properties listed in Table 1, it should be kept in mind that no high resin surface sheets were used. These electrical properties are in most cases much better than the average N.E.M.A. Standards for electrical grades are fully as good as were obtained from laminates made with the best straight cresol varnishes available and the same alpha paper, under the same conditions.

The mechanical properties are likewise much better than corresponding N.E.M.A. Standards and also better than those obtained from laminates made under similar conditions using the best straight cresol varnishes. For example, a tensile strength of more than 14,000 p.s.i. on ½-inch canvas stock is unusual, while impact strength values are likewise higher than those obtained when cresol varnishes are used.

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The Pyrolysis of Ammonium Sulphite Waste Liquor to Yield Ammonia

AARON E. MARKHAM[1], QUINTIN P. PENISTON[2], AND JOSEPH L. McCARTHY[3]

There has been reported in the literature the process of the Norsk Hydro-Elektrisk Kvaelstofaktieselskab (French pat. 823,778, October 25, 1937) by means of which the recovery of ammonia and sulphur dioxide from ammonium sulphite waste liquor is said to be possible by carrying out the following process steps: (a) heating at about 150 c. for an hour or more ammonium sulphite waste liquor containing about 50 per cent solids to convert the liquor into a solid mass, (b) drying, crushing, and then heating the solid mass in a retort for 15 to 30 minutes at 200 to 470 C. while passing nitrogen or air through the mass to carry out the liberated gas. The gas is said to contain sulphur dioxide and ammonia in amounts corresponding to 50 and 95 to 99 per cent, respectively, of the sulphur and nitrogen contained in the ammonium sulphite waste liquor processed. Further claims are: that by heating to 600 to 800 C., 70 to 88 per cent of the sulphur dioxide and 99 to 99.7 per cent of the ammonia can be liberated and recovered; that the solid remaining after pyrolysis is in a form similar to coke and contains about 4 per cent of sulphur; and that the process can be carried out over a wide range of temperature, using air or nitrogen, either dry or containing steam.

This process has accordingly been investigated because it appears to provide a method by means of which sulphur dioxide and ammonia, perhaps suitable for reuse in pulping, may be recovered from ammonium sulphite waste liquor.

Preliminary experiments were carried out under conditions duplicating as closely as possible those specified in the patent (Norsk Hydro-Elektrisk Kvaelstofaktieselskab, French pat. 823,778, October 25, 1937) when it was found that the yield of ammonia recovered under these conditions was much less than claimed, the experiments described below were performed in an effort

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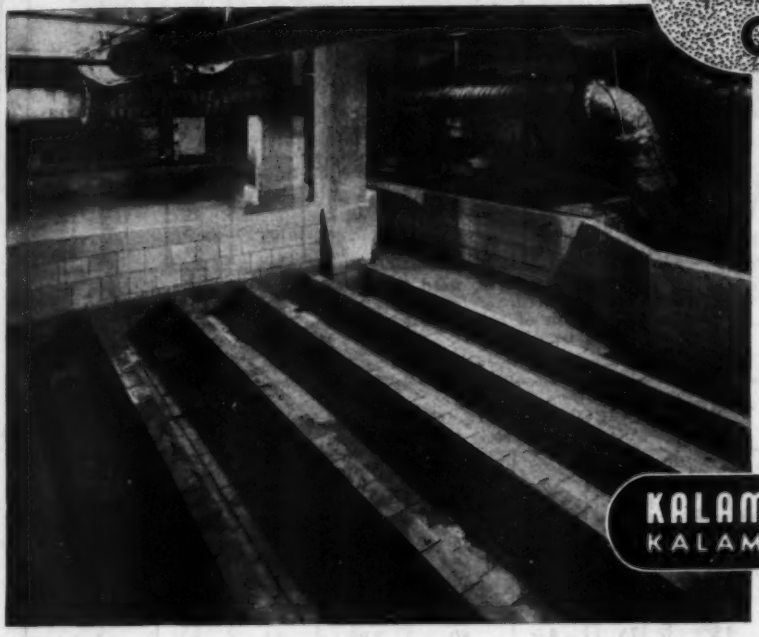

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to find reaction conditions which would permit recovery of ammonia in high yield.

If ammonia is to be recovered in high yield from ammonium sulphite waste liquor by pyrolysis, then it is essential, first, that the pyrolysis of nitrogen-containing organic compounds proceed to form ammonia and second, that this ammonia be removed from the zone of reaction before it decomposes.

In a previous report (Markham, A. E., and McCarthy, Joseph L., *Paper Trade J.*, submitted for publication), the authors have shown that 96 per cent of the nitrogen (determined by the Kjeldahl method) present in an ammonium sulphite waste liquor sample was removed onto the resin when the liquor was flowed down through a tower containing a cation exchange resin on the hydrogen cycle. This result, joined with other evidence, indicates that the nitrogen exists largely or entirely associated as ammonium salts with sulphonic acids of lignin, and with other strong acids. Since the lignin sulphonic acids are the major acidic substances present, the main problem may be considered as one of liberation of ammonia from these substances. A possible skeletal structure representing the general type of ammonium lignin sulphonate compounds of concern is given in Figure 1.

Although there is some evidence (Markham, A. E., and McCarthy, Joseph L., *Paper Trade J.*, submitted for publication) that during evaporation of ammonium sulphite waste liquor, and subsequent heating of solids as described above, reactions may occur by which some nitrogen compounds other than ammonium salts are formed, acid

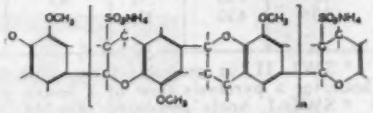

Figure 1

leaching of such solids over a period of several days has been found to remove 80 per cent of the nitrogen, presumably as ammonium salts. However, after pyrolysis of these solids, only 15 per cent of the nitrogen contained in the residue was removed by acid leaching.

That sulphonamides are formed under similar conditions was shown by Stenhouse (Ann. 140, 284, 1866) who pyrolyzed ammonium benzene sulphonate to produce a small yield (about 1.5 per cent) of benzenesulphonamide. The reaction is as follows:

Egli (Ber. 18, 575, 1885) also reported that benzenesulphonamide, as well as quinoline, was produced in small amounts during the pyrolysis of ammonium benezene sulphonate. The production of arylsulphonamides by heating the ammonium salts of the corresponding sulphonic acids above 225 deg. has been patented (Mares, J. R., U. S. pat. 2,236,825, April 1, 1941; C. A. 35, 4393, 1941).

TABLE 1—Nitrogen and Sulphur Content of Sulphite Waste Liquor Solids

Sample	Kjeldahl Nitrogen, %	Sulphur, %
I	3.50	7.53
II	1.48	
III	3.18	6.53

It seems probable that sulphonamide formation occurs to some extent on heating ammonium lignin sulphonates to give rise to the formation of insoluble lignin residues containing nitrogen and sulphur.

After liberation of ammonia from ammonium sulphite waste liquor solids, it must be removed from the hot reaction zone before combustion or thermal dissociation can occur. If pyrolysis is conducted in absence of oxygen direct combustion cannot occur.

$$N_2 + 3H_2 \leftrightarrows 2NH_3$$

However, at 1 atmosphere, total pressure ammonia is thermodynamically unstable. Calculations from the results published by Larson and Dodge (*J. Am. Chem. Soc.* 45, 2918, 1923) obtained in their study of the ammonia nitrogen-hydrogen equilibrium, show that the equilibrium mixture contains 15 per cent of ammonia at 200 C., 1.3 per cent at 325 C., and 0.12 per cent at 500 C. Even less ammonia is present at equilibrium under lower pressures. Since the combined pressure of ammonia, nitrogen, and hydrogen during pyrolysis at atmospheric pressure would be well below 1 atmosphere, it is evident that under the conditions of pyrolysis the equilibrium mixture would contain insignificant amounts of ammonia.

However, the approach toward equilibrium may not be rapid. The rate of the decomposition reaction varies greatly with the nature and magnitude of catalytic surfaces. Data presented by Kunsman (*J. Am. Chem. Soc.* 51, 688, 1929) indicate the order of

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TABLE II.—CONDITIONS OF PYROLYSIS AND RESULTS, USING APPARATUS I *

Experiment No.	Temperature, °C.	Gas	Gas Rate, liters/hour	Time of Pyrolysis, hours	Weight of Residue, % of sample	Residue Comp., % N	N Recovered, %	N in Residue, %	N not Accounted For, %
1	450	N_2	...	3.5	50	3.40	35	59	6
2	460	Air	65	5.0	3	1.56	34	1	65
3	990	Air	48	1.2	..	...	34	1	65
4	1070	N_2	100	2.3	39	1.73	43	19	38
5[a]	450	Steam	220	1.0	..	4.48	37	58	5
6	450	Steam	220	2.0	53	4.39	33	66	1
7	600	Humid air	15	0.75	22	3.53	44	22	34
8	700	Humid air	20	2.0	2	...	82	1	17
9[b]	600	Humid air	17	2.0	..	...	67	1	32
10[b]	700	Humid air	15	1.0	..	...	69	0	31

* SWL I, in granular form, used throughout except as noted. Gas not humidified except as noted.
[a] Sample in the form of concentrated solution.
[b] SWL solids III used.

TABLE III.—CONDITIONS OF PYROLYSIS AND RESULTS, USING APPARATUS II *

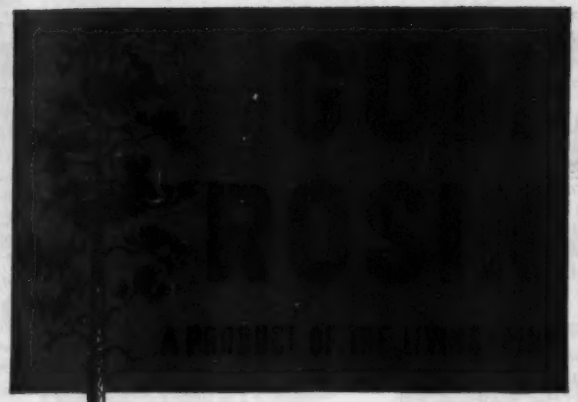
Experiment Number	Temperature, °C.	Gas	Weight of Residue, % of sample	Residue Composition, % N	N Recovered, %	N in Residue, %	N Not Accounted For, %
11	300	N_2	46	2.59	7	80	13
12	375	N_2	41	2.84	13	79	8
13	450	N_2	48	2.86	18	73	9
14	300	Air	47	2.72	8	85	7
15	375	Air	40	2 99	12	81	7
16	450	Air	37	2 87	19	71	10
17[a]	450	N_2	43	3 89	36	48	16
18[a]	450	N_2	43	4.16	38	52	10

* SWL II, in granular form, with humidified gas flowing at 1 liter per hour for a pyrolysis time of 2 hours, except as noted.
[a] SWL I, finely powdered; dry gas used flowing at 5 liters per hour for 3 hours under partial vacuum (4 to 6 cm. mercury absolute pressure).

TABLE IV.—CONDITIONS OF PYROLYSIS AND RESULTS, USING APPARATUS III *

Experiment Number	Temperature, °C.	Gas	Weight of Residue, % of sample	Residue Composition, % N	N Recovered, %	N in Residue, %	N Not Accounted For, %
19	500	Air	7	...	72	..	..
20[a]	560	N_2	49	3.72	44	52	4
21[a]	730	N_2	30	2.02	62	17	21
22[a]	840	N_2	14	1.23	55	5	40
23[a]	500[c]	N_2	46	3.81	38	50	12
24	620	Air	29	3.66	30	31	39
25[b]	510	Air	9	3.04	64	7	29
26	650	Air	0	...	63	0	37
27	500[c]	N_2	43	3.15	57	38	5
28	620	N_2	10	2.12	86	6	8
29	650[c]	Air	0	...	71	0	29
30	650[c]	Air	8	1.90	86	5	9
31[b]	700[c]	N_2	0	...	94	0	6
32	800[c]	Air	0	...	81	0	19
33[b]	800[c]	Air	0	...	80	0	20

* SWL I used throughout as fine powder, except as noted. Gas rate, from 5 to 10 liters per hour. Duration of each experiment, 2 hours. Gas humidified excetp in expts. 23 and 24. Samples in expts. 27 to 33 were wrapped in cellophane. Sample in expt. 26 added as liquid.
[a] Sample in granular form.
[b] Sample dampened to form a paste.
[c] Temperature measured in furnace, probably up to 80° too high.



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magnitude of the rate of decomposition on representative surfaces. On a promoted iron oxide catalyst, which caused the most rapid decomposition of those catalysts he investigated, the half life of the ammonia at a pressure of 5 cm of mercury varied from about 1 minute at 380 C. to 9 minutes at 230 C. Dilution of the ammonia with an equal volume of hydrogen reduced the rate of decomposition by 50 per cent. The rate varied many thousand fold with different catalytic surfaces, and on one of the surfaces with least catalytic activity was the same at 780 deg. as on the ferric oxide at 360 deg.

The ash resulting from the pyrolysis of ammonium sulphite waste liquor solids contains considerable quantities of oxides of iron. This ash, as well as the surfaces of a retort, may to some extent catalyze ammonia decomposition. However, the retort surfaces may be made relatively small and the gases produced in the pyrolysis need not be in prolonged contact with them.

From these considerations, no serious decomposition of ammonia was expected at moderate temperatures as long as the products of pyrolysis were rapidly swept out of the hot region by a continuous stream of gas.

This expectation was strengthened by the experience of Monkhouse and Cobb *(Trans. Inst. Gas Eng.* 1920-21, 543; 1921-22, 137) who were able to convert the nitrogen in coke almost quantitatively into ammonia by prolonged heating (100 to 200 hours) in a stream of steam or wet nitrogen. Destruction of ammonia was serious only when the nitrogen used for sweeping it out was not humidified.

Preparation of Sulphite Waste Liquor Solids

The ammonium sulphite waste liquor used in most of the experiments was prepared by pulping hemlock chips in ammonium, bisulphite solution, using a 50-liter stainless steel rotary autoclave in the Chemical Engineering Laboratories of the University of Washington. The resulting sulphite waste liquor was subjected to steam stripping and was then evaporated under vacuum to a concentration in total solids of over 50 per cent (Markham, A. E., and McCarthy, Joseph L., *Paper Trade J.*, submitted for publication). The concentrated liquid was converted to a solid, as needed, by heating under pressure for an hour at 150 C. (Norsk Hydro-Elektrisk Kvaelstofaktiesels-kab French pat. 823, 778, October 25, 1937). The black solid so produced readily air dried to a brittle mass which was easily crushed to any size desired for the pyrolysis. Solids from two such sulphite waste liquor preparations (I and II) were prepared.

To provide the larger amounts of sulphite waste liquor solids used in the later experiments, a quantity of commercial ammonium sulphite waste liquor was obtained. This liquor was evaporated to dryness at atmospheric pressure to produce solids (III). The analysis of these solids on an air dry basis is shown in Table 1.

Apparatus

The apparatus used in each of the pyrolysis experiments consisted of a retort or its equivalent for the pyrolysis, with auxiliary heaters, humidifiers, condensers, and absorbers. Several different retorts were used as follows:

Apparatus I consisted of a 25-mm. diameter glass combustion tube lying horizontally in an electrically heated tube furnace. The sample was placed in a porcelain boat or glass tube which was inserted in the combustion tube. Gas was either forced through the tube by running water into a connected gas-containing bottle, or was drawn through the tube by an aspirator. The temperature was roughly indicated by a thermo-couple located just above the sample. The heating of the furnace was regulated by a Variac autotransformer.

Apparatus II was in the form of a Pyrex glass retort of about 50 ml. capacity, which was heated by a molten salt bath (sodium and potassium nitrates in eutoctic mixture). A small tube entering the bottom of the retort served for the introduction of gas. The temperatures observed were those of the salt bath. When this apparatus was used, the retort containing the sample was placed in the bath, already heated to the temperature of the experiment. Thus the sample was heated rapidly to its final temperature.

Apparatus III was a vertically positioned 12 inch length of 0.75 inch diameter stainless steel tube, with an inlet tube for gas at the bottom, and an outlet tube at the top. The cover was held on by a flared fitting. The retort was heated in an electric furnace used for heating crucibles in coal analysis. The furnace temperature was measured by a built-in pyrometer. The furnace temperature was found to read about 80 deg. higher than that observed inside the retort by a thermocouple.

Apparatus IV consisted of an 800-ml. Kjeldahl flask, heated by an electric furnace. The temperature of the furnace was regulated with a Variac autotransformer. A glass tube, through which the solids or concentrated sulphite waste liquor were added, was inserted into the neck of the flask which was closed by a rubber stopper. A thermocouple reached nearly to the bottom of the flask.

Apparatus V was made for larger scale experiments and consisted of a cylindrical steel shell lined with refractory which formed a combustion chamber 30 inches high and 4 inches in diameter. A sheet steel stack superimposed on this chamber was provided with means for adding fuel and for stirring the fuel bed, and had an outlet for the combustion gases. A grate at the bottom of the combustion chamber supported the fuel bed. Steam, gas, or air could be introduced through tubes entering below the grate. A large vacuum pump drew air through the apparatus.

Absorbers: A system of condensers and absorbers was used with each retort to remove the ammonia from the gas stream. A glass water-cooled condenser first cooled the gas and condensed most of the water. A loose filter of glass wool following the condenser removed most of the tar. The gas was then washed by bubbling it through several absorbers containing dilute hydrochloric acid.

Procedures for Pyrolysis

The procedures used in the operation of the different retorts differed only in details. With apparatus I through IV the sample size varied from 4 to 10 grams of solids. In general, the weighed sample of sulphite waste liquor solids (through 10-mesh screen) was put into the retort and heated, while air or nitrogen was passed through the retort. This gas rate was closely controlled and was measured, when possible, by means of a wet test meter. The air or nitrogen was sometimes used without humidification, but more often was humidified by passing it through a flask of water maintained at a temperature near the boiling point. After the sample had been heated for the desired length of time, the heating and gas flow were stopped, the absorbers were disconnected, and the condensate and absorbent were combined and sampled for

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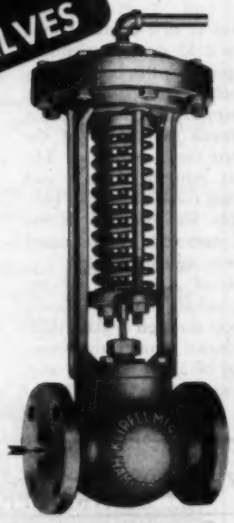

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analysis. The solid residue from the retort was weighed and analyzed for nitrogen.

In the operation of Apparatus I, the sulphite waste liquor solids were put into the cold combustion tube, and the temperature raised over a period of about an hour or more to the maximum value, where it was held for the desired period. For reasons to be explained later, this slow heating seemed undesirable, and the other pieces of apparatus were planned to eliminate it. In the operation of Apparatus II, the sample was put into the cold retort, the air stream started, and the retort dipped into the hot salt bath.

Apparatus III was at first operated in a similar manner, the cold retort, containing the sample, being put into the hot furnace. Later, a different method was used, in which the sample was wrapped in cellophane, and suspended by a thread in the top of the retort, above the part that was heated. The retort was then set into the furnace and heated. When it had come to furnace temperature, the sample was dropped to the bottom, came in contact with the hot metal surface, and thus was heated rapidly.

In the operation of Apparatus IV the solid (or liquid) sample was fed slowly into the heated retort through a glass tube, while wet air was drawn through the retort.

Apparatus V was of a much larger size, and was designed to pyrolyze from 100 to 1,000 grams of sulphite waste liquor solids at one time. It was first operated as a gas producer; the solids were put into the combustion chamber, ignited, and gasified by drawing a stream of humid air through the burning mass.

In later experiments this apparatus was also operated much as was apparatus IV. The bottom of the combustion chamber was filled with coke, which was started burning. The sulphite waste liquor solids were then dropped slowly onto this hot fuel bed, while air was drawn through. The solids were also fed in the same way onto a hot surface of quartz lumps, the quartz being kept hot by a gas flame.

Several sources of difficulty and error, inherent in the small scale experiments reported here, should be mentioned. Water usually condensed from the humid gas stream in the cooler portions of the combustion tube or retort. There was frequent breakage as this water ran into the pyrolysis zone, and products were lost as the liquid dried and was baked onto surfaces of intermediate temperature. The addition of sample to the retorts at a high temperature almost invariably resulted in some losses of solids which adhered to the tube used for the addition, or which were carried out of the retort into the absorber. Volatile products occasionally escaped through the sample addition tube or the air inlet tube, as a

TABLE V.—CONDITIONS OF PYROLYSIS AND RESULTS, USING APPARATUS IV

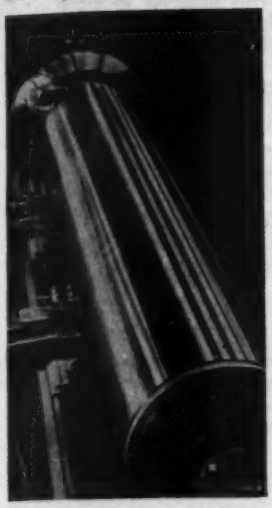
Experiment Number	Temperature, °C.	Weight of Residue, % of sample	Residue Composition, % N	N Recovered, %	N in Residue, %	N Not Accounted For, %
34	400	44	5.44	16	71	13
35	430	45	4.49	27	59	14
36	470	39	4.88	26	56	18
37	500	42	4.62	28	57	15
38[a]	530	34	4.61	31	46	23
39	530	30	4.60	39	41	20
40	575	24	4.19	51	29	20
41	600	4	3.71	68	5	29
42[b]	530	43	3.42	50	38	12
43[b]	600	31	2.88	57	23	20
44[c]	700	2	...	61	..	39

* SWL I used throughout, in solution containing 60% total solids, except as noted. Wet air flowing through retort at 3 to 8 liters per hour, for 2 hours, except as noted.
[a] Time, 1.3 hours.
[b] Solid sample in granular form used.
[c] Time, 2.5 hours; solid fed in granular form; air rate, 35 liters per hour.

TABLE VI.—CONDITIONS OF PYROLYSIS AND RESULTS, USING APPARATUS V *

Experiment Number	Time, hours	N Recovered, %	N in Residue, %	N Not Accounted For, %
45	7	13	1	86
46	7	23	11	66
47	0.4	31	0	69
48	0.4	18	0	82
49	0.4	45	0	55
50	0.75	36	0	64
51	0.7	52	0	48

* SWL III in granular form used throughout, with humid air flowing through the retort. The apparatus was used as a gas producer in expts. 45-46. The SWL solids were dropped on a hot coke bed in expts. 47-49, and on a hot quartz bed in expts. 50-51.



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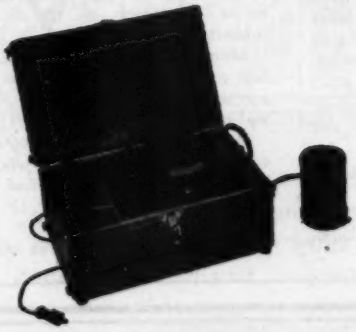

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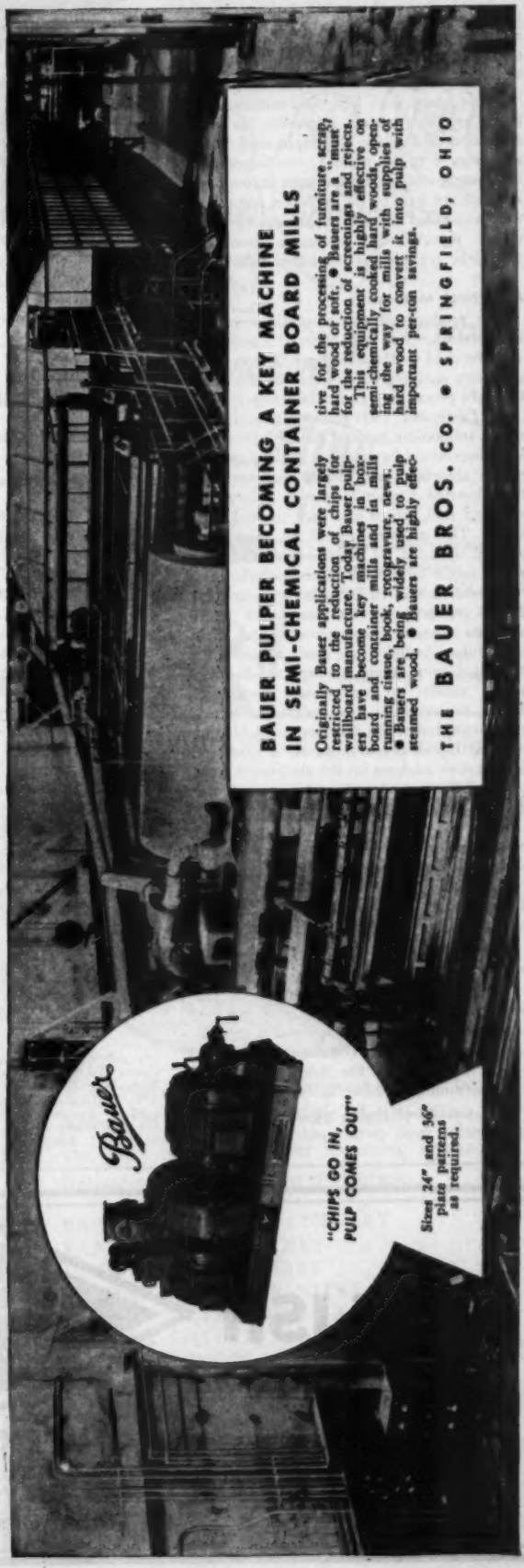
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result of rapid expansion. Solids remaining after the pyrolysis could not always be removed quantitatively from the retort for weighing and analysis.

These losses were kept to a minimum by every available means. However, in consideration of the size of sample used (usually from 4 to 10 grams), the losses may in a number of the experiments account for a significant part of the nitrogen not otherwise accounted for. As a consequence, the values reported for ammonia recovered should be regarded as minimum values.

Analytical Methods

The products of the pyrolysis were the solid residue and the material condensed and absorbed in the absorbers. These products were analyzed for nitrogen by the usual Kjeldahl procedure (Lauro, *Ind. Eng. Chem., Anal. Ed.* 3, 401, 1931). The nitrogen present as ammonium salts in the absorbent was also determined by treating an aliquot part of the absorbent with alkali and distilling the liberated ammonia into a volume of standard acid, which was back titrated with alkali. The nitrogen found by this latter method included all volatile nitrogen bases which might be present. Thus methylamine, if present, would be included as ammonia. There are probably no more than small amounts of such bases present, and their bisulphites, included in small amounts in pulping liquor, might be expected to have action similar to ammonium bisulphite. Hence, the result of this analysis is considered to represent the nitrogen available for pulping liquor preparation. As a result of comparative analyses on the absorbents from many of the early experiments, it was found that this figure for nitrogen was always the same as the Kjeldahl figure within 1 to 3 per cent. The two results are thus identical within the experimental error, and in later experiments only the Kjeldahl nitrogen was determined. Most of the results reported here are those of Kjeldahl nitrogen.

All results were calculated to a basis of nitrogen.

Total sulphur was determined in the products of pyrolysis in several of the experiments. The method used was a modification by Yorston (Private communication, May 21, 1945), of the A.S.T.M. method for determining sulphur in rubber.

The conditions under which the several experiments were carried out, and the results secured, are given in Tables 2 to 6.

The course of the ammonia liberation with time was followed in experiment 44.

Here again it is shown that the major portion of the total ammonia yield was liberated almost as soon as the solids were brought to pyrolysis temperature. (In this experiment a substantial amount of gas escaped through the sample tube and air inlet tube.)

Ammonium sulphide waste liquor solids can be pyrolyzed to yield ammonia equivalent to about 90 per cent or more of the nitrogen originally present in the solids. A temperature of about 600 C. or more is necessary to complete the pyrolysis in a reasonable time. Satisfactory recovery can be achieved only by nearly complete gasification of the solids. The gas is combustible but of unknown heating value. The atmosphere around the solids during pyrolysis must be humidified. When the waste liquor is fed as concentrated solution to the pyrolysis retort, the yield of ammonia is about equal to the yield obtained by the use of dried solids. Rapid heating of the solids is desirable since it evidently results in more rapid pyrolysis, but it is not necessary. Although a considerable part of the sulphur is recoverable by the pyrolysis, it is in a form which is not readily available for reuse.

Ownership and Availability of Lake States Pulpwood*

R. N. CUNNINGHAM
Forest Economist
Lake States Forest Exper. Station**

About one-sixth of the nation's pulp and paper industriy operates in the three states of Michigan, Minnesota, and Wisconsin. For raw materials, this industry depends largely upon products from 50 million acres of local commercial forest land. Its current and prospective wood requirements are well within the productive capacity of these forest lands. However, the industry's strong preference for certain species on the one hand, and the past abuse of the lands producing these species, has led to serious if temporary shortages. The industry, naturally, is concerned with the problem of what it can do to improve this situation.

Location of Supplies

Roughly, two-fifths of the pulpwood supplies of the region are found in Minnesota, two-fifths in Michigan, and only one-fifth in Wisconsin. The Wisconsin share of some of the key species is even smaller, being only 17 per cent of the jack pine and only 11 per cent of the spruce and fir (Table 1).

In Minnesota, the bulk of the pulpwood supplies is in the northeastern corner of the State, at some distance from the mills and some of it not readily accessible by existing means of transportation. For example, 60 per cent of all the Jack pine in the State is in this northeast corner (Figure 1), as well as 40 per cent of the spruce and fir. These species are much more heavily depleted in districts immediately tributary to the principal mills (Figure 1).

In Michigan, the largest share of jack pine is found in the northern half of the Lower Peninsula. Otherwise, the larger supplies of pulpwood remain in the Upper Peninsula, which has 93 per cent of the State's spruce and fir and 95 per cent of its hemlock.

This distribution of timber is not advantageous for the majority of Lake States pulp and paper mills. Nearly half of the region's paper-mill capacity is concentrated in lower Michigan, mostly in the vicinity of Kalamazoo. This district is no longer a large pulp-producing area, and is far removed from important stands of softwood pulp timber.

The Fox River and Wisconsin River Valleys in Wisconsin include another major segment of the paper-mill capacity and a preponderance of the region's pulping capacity. Yet, the surrounding area has only minor quantities of mature pulpwood timber.

Minnesota, which contains some of the best remaining supplies of spruce and pine, has a relatively small share of the pulp- and paper-mill capacity.

Because the industries are concentrated at considerable distances from wood supplies, we find rather extended wood movements within the region (Figure 2). Wisconsin mills, for example, received 27 per cent of their wood from Canada in 1946, 29 per

(*) Abridgment of paper given at the Lake States TAPPI meeting at Wisconsin Rapids, Wis., May 15, 1948.

(**) Maintained by the Department of Agriculture, Forest Service, in co-operation with the University of Minnesota, University Farm, St. Paul 1, Minn.

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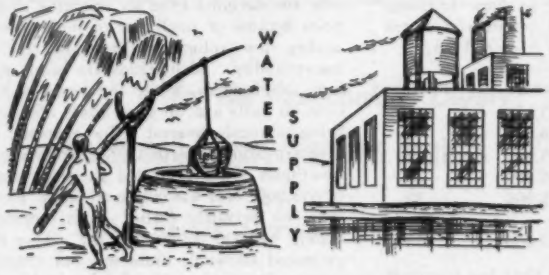

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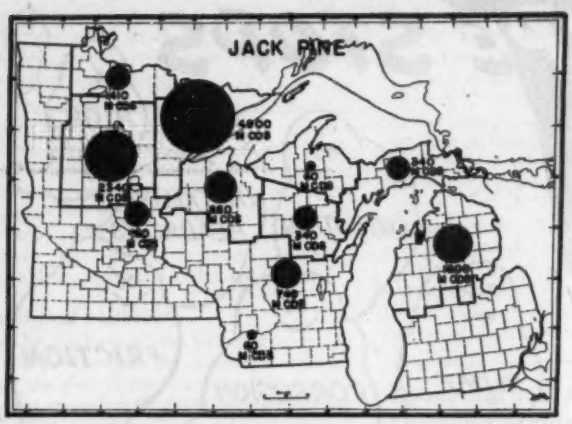

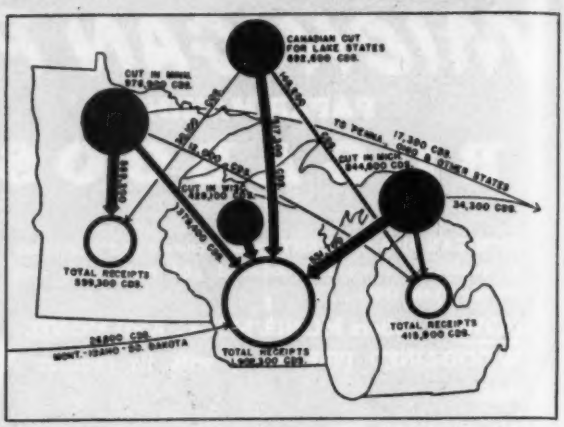
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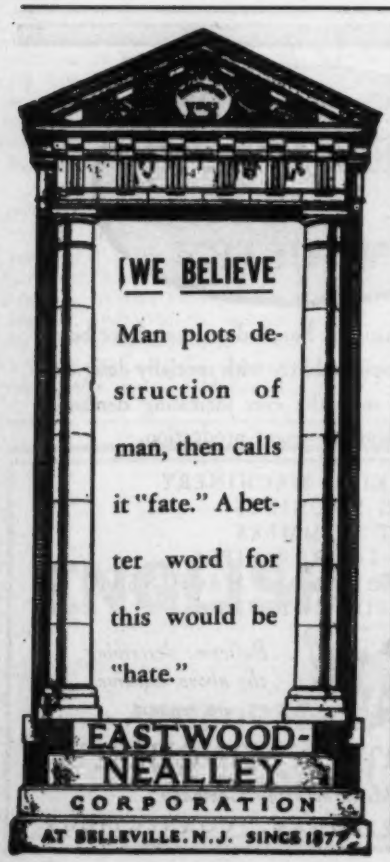
Fig. 1 (left)—Distribution of jack pine pulpwood volume by forest-survey districts—1945 . . . Fig. 2 (right)—Movement of pulpwood in the Lake States, 1946. Black circle indicates volume of wood cut, arrows show shipments, open circles show volume of total receipts by mills in State

cent from the Upper Peninsula of Michigan, 20 per cent from Minnesota, 1 per cent from the Rocky Mountain states. They obtained only 23 per cent from Wisconsin sources.

This maldistribution of supplies is not inherent in the Lake States situation. Wisconsin has essentially the same productive forest acreage as the adjoining states, and equal capacity for growing timber. Southern Michigan once produced the heaviest pine yields in the region. The present shortages have developed because forest regeneration has not kept pace with cutting of mature timber. It can be corrected by concerted efforts to build up the existing young stands and reforesting presently understocked spruce-fir and pine lands in these states. On the other hand, Minnesota, if it can maintain its forest lands permanently productive, without doubt can induce new industries to set up processing plants within its borders.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Ownership of Pulp Timber

Public ownership is a much larger factor in the Lake States than in other parts of the Eastern United States. More than 40 per cent of the commercial forest land here is controlled by federal, state, and county governments, as compared with 9 per cent in the South, 6 per cent in the Central States, and 5 per cent in New England. The actual division of commercial forest land in the Lake States is as follows:

	Acres	*Per cent*
Federal	6,495,000	13
State	7,810,000	15
County	6,995,000	14
Farm	13,930,000	28
Other private	15,115,000	30
Total	50,345,000	100

Public agencies own a little less than half of the merchantable volume of the more common pulp species, having 48 per cent of the spruce and fir, 67 per cent of the jack pine, 65 per cent of the aspen, but only 12 per cent of the hemlock.

In the case of spruce and balsam fir, the State holds a dominant position in Minnesota, whereas in Wisconsin and Michigan the public agencies are surpassed by private owners (Figure 3).

In the case of jack pine, the outstanding ownership is federal because of the large block of mature pine on the Superior National Forest in Minnesota (Figure 4).

In contrast with the other softwoods most hemlock is privately owned. The only very large public block is in the Menominee Indian Reservation in Wisconsin.

Aspen is reasonably abundant in all ownerships and in the aggregate supplies exceed annual drain by a large figure. However, many stands, particularly on public forests, are marginal from an operating standpoint because of small size of timber, poor quality, low volume per acre, or relative inaccessibility. Such stands are being utilized insufficiently, while the better stands close to mills and on good roads often are being seriously overcut. For example, in northern Minnesota, in 1946-47, only about two-thirds of the estimated allowable drain of 653,000 cords was cut on all lands. However, on privately owned lands, approximately 347,000 cords were cut, where the estimated allowable drain was but 278,000 cords. In contrast, the federal, state, and county lands yielded only 99,000 cords from their estimated capacity of 375,000 cords.

Federal Ownership

The federal timberlands, mainly in Na-

Table 1.—Total supply[1] of timber of principal pulping species in the Lake States, by state and species—1945

State	Principal pulping species				
	Spruce and balsam fir	Jack pine	Hemlock	Aspen	Total
	Thousand of cords (rough wood)				
Minnesota	13,500	8,100	0	24,600	46,200
Wisconsin	3,100	2,000	4,600	12,800	22,500
Michigan	11,100	1,600	15,700	20,700	49,100
Region	27,700	11,700	20,300	58,100	117,800

(1) The volumes consist of both sawlog-size material and sound cordwood to a minimum 4-inch top. This includes some material too rough or crooked to make standard pulpwood but, except in the case of aspen, the proportion of substandard wood is small. Approximately 25,500 M cords of the aspen is substandard.

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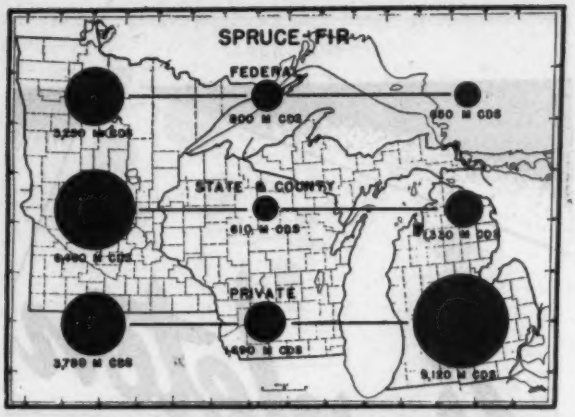


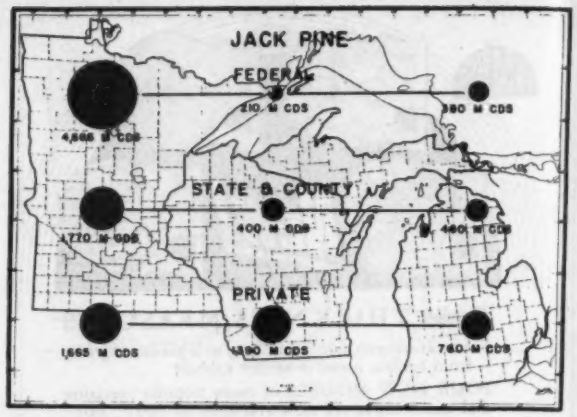
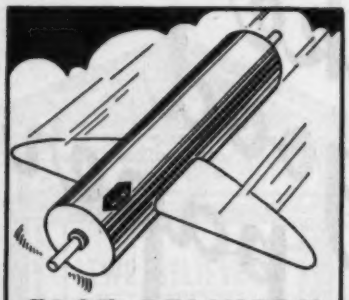


Fig. 3 (left)—Division of spruce and balsam-fir volume between public and private agencies in each Lake State—1945. . . . Fig. 4 (right)—Division of jack pine volume between public and private agencies in each Lake State—1945

tional Forests and Indian Reservations, are being managed rather intensively but are yielding at present less than one-tenth of one cord per acre per year of saw timber and pulpwood. These forests, many of them created during the 1930's from recently logged or burned lands, include extensive areas of seedling and sapling timber with intermingled grass and brush. They include some mature timber, but mostly in scattered patches or in rather inaccessible locations. To increase the yields substantially will require accelerating the planting of deforested areas, constructing more access roads to tap presently merchantable stands, and maintaining sufficient timber-sale personnel to permit making many small timber sales from thinnings and improvement cuttings.



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State Ownership

The states each have several productive and well-managed state forests, but they also have other large holdings—game projects, water-control projects, and unorganized wild land—on which the production of forest products is only partially developed. The over-all average annual yield is only about one-twentieth cord of saw timber and pulpwood per acre. To increase timber production will require consolidating the scattered blocks of land, preparing management plans which emphasize sustained yield of forest products, as well as game and recreation, and strengthening of timber-marketing organizations. States, likewise, need to speed up reforestation of understocked land.

County Ownership

Northern counties in Minnesota and Wisconsin have large acreages of forest land which have reverted for nonpayment of taxes. Michigan counties, because lands forfeited to the State in this case, have very little. County forest lands, if well managed, will be very productive some day, but at present yield as an average less than one-fortieth cord per acre per year of saw timber and pulpwood. They urgently need consolidation and constructive long-range planning. They could yield more than they do now if all counties had foresters to develop small sales from thinnings and improvement cuttings.

Farmer Ownership

Many of the farm woods are naturally productive and are strategically located with reference to forest industries. Most of them, however, are run-down from overcutting, burning, and pasturing. They yield as an average about one-eighth cord per acre per year of saw timber and pulpwood, and additional volumes of fuelwood, posts, and miscellaneous products. Total cutting of high-grade products is more rapid than can be sustained in their present condition. Opportunities exist for increasing yields within relatively short time by improved cutting practices, restricted pasturing, better protection and reforestation. The best approach appears to be through forestry education, more extension work, increased advisory service to farmers, and offer of inexpensive planting stock. Conservation payments for planting under the AAA program have been effective in some places.

The extreme diversity of ownership is a complicating factor in trying to devise plans for constructive management for the private timberlands. Approximate ownership in 1945 was about as follows:

	Acres	*Per cent*
Pulp companies	1,564,000*	10.3
Lumber companies	1,634,000	10.8
Mining companies	600,000	4.0
Hunting and recreation	110,000	.7
Railroads	27,000	.2
Light and power companies	205,000	1.4
Land company and miscellaneous	360,000	2.4
	4,500,000	29.8
Miscellaneous, small	10,615,000	70.2
Total	15,115,000	100.0

*Probably 2,000,000 acres now.

It seems inescapable that the pulp and paper companies will have to expand their own holdings to insure proper treatment of the forest lands upon which they depend for future raw materials. They can also take the initiative in promoting co-operative arrangements with lumber companies, mining companies, resort owners, and some other classes of owners, with the idea of developing management plans for integrated use.

From this review it will be seen that the Lake States pulp and paper industry, now producing about one-sixth of the nation's wood fiber, is faced with a complex and difficult problem of insuring adequate future supplies of pulpwood. Because it presently owns only about 3 per cent of the forest land in the region, it is very vulnerable in this period of generally short timber supplies. It can do much to improve the situation by expanding its own holdings, by lending support to programs of public agencies, and by taking the initiative in promoting co-operative management plans with other landowners looking toward integrated utilization of available forest products. Some progress is being made along these lines already.

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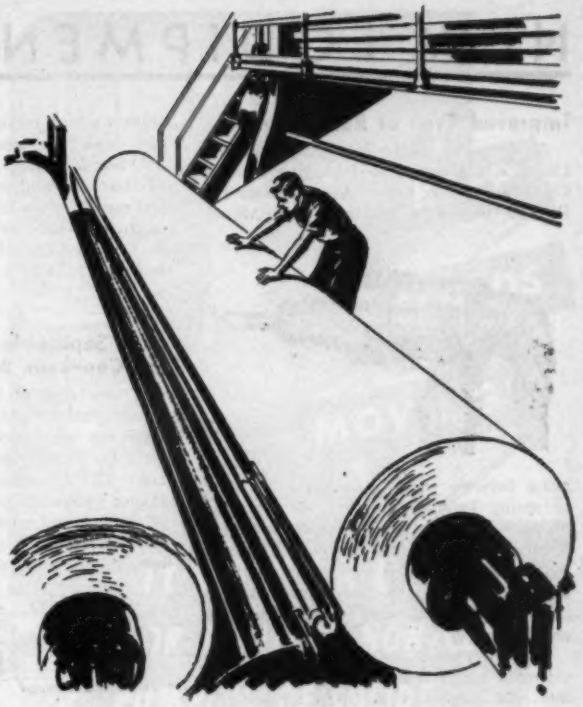

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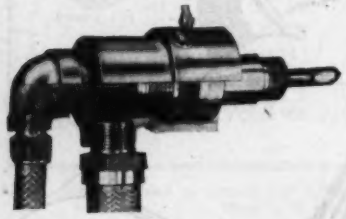


metal bellows which eliminates the need of spring loading, provides self-adjusting pressure on extra heavy service, bringing friction drag down to a new low. This all-purpose ball bearing is used for introducing steam or coolants into rotary drums such as used on paper machines, dryers, calenders and coaters.

The ball bearing construction permits considerable horsepower saving, and the flexible hose eliminates the need for complicated piping and supports. It is available in plain, "P," and sulphon, "S," types.

Glass Reinforced Hose and Conveyor Belt

Development of a hot materials conveyor belt, that is cushioned with rubber and strengthened with glass, has been announced by the Hewitt Rubber Division, Hewitt-Robins Inc., of Buffalo.

Simultaneously, Hewitt engineers also have developed a glass-fiber rubber hose which they claim resists any kind of acid and gives much longer service than standard cotton yarn reinforced hose.

These new Hewitt developments mark the first time glass reinforcement has been used in the manufacture of conveyor belting or hose, it was said. Fiberglas fabric is used in producing the belting, while Fiberglas yarn is the reinforcing material in the hose.

Fuel Oil Cleaner

A new fuel oil additive, designed to clean oil systems from tank to stack, has been developed by E. F. Houghton & Co., 303 W. Lehigh Avenue, Philadelphia.

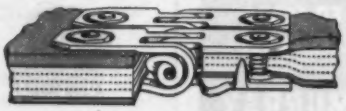
Sludge deposits in oil tanks and systems have long been a problem to plant maintenance men. To ease this problem the research department of E. F. Houghton & Co. developed a low cost additive to remove all traces of sludge throughout the entire fuel system. The answer was a mixture that took the sludge into solution and made it a burnable part of the fuel. It is called *Houghto-Solv*.

Aside from doing the job assigned to it, *Houghto-Solv* passes all other rigid requirements for plant use. It meets all plant safety regulations. It is safe to use and store and is not toxic. It is non-corrosive and will not harm metals or working parts of the heating system. It also stops formation of soot which insulates boiler surfaces and cuts down heat values.

Other advantages of this cleaner include effective cleaning of tanks, line strainers, and nozzles at low cost. It is added directly to the fuel tank in the ratio of one quart to 1,000 gallons of fuel oil. The cost is less than 1/16 of a cent per gallon of fuel oil.

New Separable Fastener for Conveyor Belts

A new type of separable conveyor belt fastener called the Hinged *Flexco Belt Fastener* has been announced by the Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44. It consists of a series of U-shaped galvanized plates bolted to each end of the belt and joined together with a flexible hinge pin. It is made in one size for belts 3/8 in. to 1/2 in. thick.



Diagrammatic view of the Hinged Flexco Belt Fastener showing how the U-shaped plates are bolted to each end of the belt

Special features include: (1) the cutting of the belt ends in a concave arc and (2) the hinge pin made of tightly wound spring steel that bands easily with the troughing of the belt and which is always readily removable because there are no small wires to fray out.

Tests have shown that a joint in a new 30-in. belt will stand a pull from 18,000 to 22,000 lb., depending on the belt construction.

To complete the conveyor belt joint the flexible steel hinge pin is inserted as shown here

The Hinged Flexco Belt Fastener was particularly designed for use on underground extension conveyors in coal mines and has been field tested for almost two years. The use of this unique fastener has also been extended to portable types of conveying equipment where the conveyors must be dismantled and moved to a new location.

This type of fastener is designed for all applications where conveyor belts must be extended or dismantled.

Transparent Coating

Metal, wood, leather and fabric surfaces can now be protected from corrosion and deterioration by a new transparent liquid "skin" which is being introduced to the industrial world for the first time, according to an announcement by its manufacturer, State Chemical Corp., 1265 Broadway, New York 1, N. Y.

Called *Permacote*, the new versatile protective coating was designed for use on surfaces which require protection from moisture, acids, alkalis, alcohol, dyes, dirt, dust, etc. It can easily be applied by brush, spray or dip and forms a tough transparent coating which remains permanently flexible and is highly resistant to abuse by either physical or chemical means. The new product is also resistant to extremes of heat or cold and will not crack or chip in spite of the expansion or contraction of the surface it protects. The coating imparts a lustre to any surface it is applied to and effectively seals in and prolongs the life of ordinary paints, lacquers and varnishes. The new protective liquid is available in one and five gallon cans as well as in 50 gallon steel drums.

Non-Clog Sewage Pump

A completely redesigned and improved small non-clog sewage pump is announced by Economy Pumps, Inc., Hamilton, Ohio. The new pump is primarily adapted to the pumping of miscellaneous pulps, sewage, or trash.

Shaft and bearings of the new pump have been increased in size, using a two-rot heavy

duty ball bearing with matched angular contact thrust bearings. Both radial and thrust bearings are enclosed in a sub-assembly cartridge for easy, quick replacement of the rotating element. Removal of the rotor does not expose bearings to dirt and does not lose adjustment of bearings.

For protection against moisture and corrosive gas, all bearings are grease lubricated.

Six rings of packing with a lantern for external seal connection are provided on the

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The heart of this pump is the impeller. The two-port Peerless impeller, shown below, has unique repelling vanes on both the outer shrouds, and scientifically designed working vanes of uniform thickness to keep solids moving. Peerless Non-Clog Sewage Pumps offer a modern and dependable means of pumping entrained solids in sewage disposal service, paper mills, canneries and packing plants, process industries, and for lift stations, railroad underpass applications, etc.

No rings to clog—no seals to bind! Unique repelling vanes on both outer shrouds keep solids clear at casing side walls.

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By eliminating all wearing rings, end plates, filler rings, etc. and minimizing recirculation losses, the advanced design principle of the Peerless Sewage Pump is the ideal choice for maximum clog-free pumping service with down time at a minimum.

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stuffing box. The sturdy labyrinth flinger is positive with a large bearing surface to eliminate any leakage between the shaft and flinger. A simple external adjustment is provided to take up wear at the impeller inlet.

Material Cleans and Deodorizes at Same Time

A new chemical material possessing the dual ability to clean and deodorize in a single, simultaneous operation has been announced by Oakite Products, Inc., 116 Thames St., New York 6, N.Y.

This new material, known as *Oakite Di-Sanite*, is a fine, free-flowing powder, mildly alkaline, that is readily soluble in hot or cold water, and which is said to possess pronounced wetting, penetrating and detergent ability, as well as deodorizing action. Materials safe to use, free from abrasives and harmful ingredients, and its solutions may easily be applied on surfaces by simple sponging, wiping or mopping, the manufacturer states.

Suitable for use in practically every industry, *Oakite Di-Sanite* is highly effective in destroying objectionable odors at the source in plants such as paper mills; also for deodorizing toilets, shower stalls, wash and locker rooms.

Portable, Self Operating Spot-Welder

A new lightweight completely portable and self-operating spot-welder that may soon revolutionize present spot-welding methods is now being made available by its manufacturer, Greyhound A. C. Arc Welder Corp., 606 Johnson Ave., Brooklyn 6, N. Y.

Described as an essential tool for sheet metal and truck and body repair shops, the new portable spot-welder is also said to be ideal for welding jobs on window frames, skylights, display signs, kitchen equipment, wire fences, blowers and ventilating systems. Among its many other uses, it is excellent for quick welding jobs in hard to get to places and is a time saver on outside repair jobs which cannot easily be carried into the shop. Light in weight—only approximately 23 lb.—the unit is moderately priced for wide distribution.

Called *Greyhound Portable Spot-welder*, it easily welds up to ⅛ in. combined thickness of metal. The self-operating unit is enclosed in a compact non-corrosive cast aluminum casing with an integral aluminum handle for easy carrying. The protruding copper arms are available in three lengths—6, 12 and 18 inches—and durable replaceable special alloy tips are available in an assortment of shapes for specific needs. Each unit has a silicon steel and copper transformer wound with burn-out-proof spun-glass insulated magnet wire, said to be an assurance of safe high heat conductivity. Available in either 220 or 110 volt units, each portable spot-welder is supplied with 10 feet of cable.

Glass Fabric Conveyor Belt

Development of a hot material conveyor belt using glass fabric instead of the cotton fabric used in the conventional belt made for this service is announced by The B. F. Goodrich Co., Akron, Ohio.

COMING EVENTS

Aug. 16-17—TAPPI, first national fall meeting sponsored by the Plastics Committee, to be held at Institute of Paper Chemistry, Appleton, Wis.

Aug. 18-20—TAPPI, second national fall meeting, sponsored by the Fundamental Research Committee, to be held at the Forest Products Laboratory and the University of Wisconsin, in Madison, Wis.

Sept. 8-10—Summer meeting of the Technical Section, Canadian Pulp and Paper Association, Hotel Vancouver, Vancouver, B.C.

Sept. 13-17—Third Instrument Conference and Exhibit, Philadelphia Convention Hall, Philadelphia, Pa.

Sept. 27-29—TAPPI (National) fall meeting, Mechanical Pulping Committee, Poland Springs, Me. Poland Spring House (Joint meeting with the CPPA Technical Ass'n).

Oct. 11-13—TAPPI (National) fall meeting, Testing Division, Pittsburgh, Pa., at the Mellon Institute (Headquarters at William Penn Hotel).

Oct. 12-16—Fifth National Chemical Exposition by the Chicago Section of the American Chemical Society, Chicago Coliseum, Chicago, Ill.

Oct. 18-22—Thirty-sixth Annual Safety Congress, Stevens Hotel, Chicago, Ill.

Oct. 25-28—TAPPI (National) fall meeting, Third Engineering Conference, Buffalo, N.Y., Statler Hotel and the auditorium of Westinghouse Electric Co.

Oct. 28-30—Meeting of National Paper Trade Association, Hotel Stevens, Chicago, Ill.

The company suggests for this use two weights, a four-ply for light service and a five-ply for wider, longer belts where working stresses will be somewhat higher than in the light service. Covers recommended are either a 5/32 in. top and 1/32 in. back or a 3/16 top and 1/32 back, depending on operating conditions.

Included in the belt's top cover will be a ply of longitudinal nylon breaker which to give best production is floated 1/32 in. above the carcass.

The company says that the tensile strength of each ply of glass fabric is approximately equal to the standard 32 ounce cotton fabric used in conventional belts.

Advantage of glass fabric for this service, the company says, is its resistance to loss of carcass strength under high temperatures. Cotton fabric loses strength rapidly under these severe operating conditions.

One experimental belt which was installed on a short conveyor for carrying hot molding sand from below a foundry shapeout machine was on 888 hours before the test was terminated and the belt removed for inspection. Normal service given by a conventional cotton fabric belt in the same service was 456 hours.

In another test, a glass fabric belt carrying hot lime ranging in temperatures from 300 to 450 Fahr. was in service a year before removal for inspection, while the best record accomplished by a conventional cotton fabric belt on this conveyor had been seven months.

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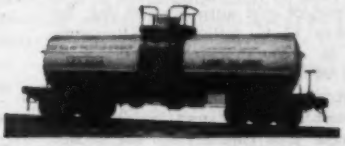

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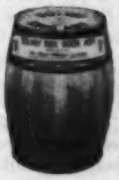

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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Corrosion, and Means Employed In Its Prevention

The use of various plastic coatings in the mill is stressed. Neoprene may be applied to wood and to steel and often serves as an excellent coating material, the applications of which are given in some detail. However, neoprene is unsuited for coating equipment in which bleach liquors are used, and here "Nitrocote" may be applied, providide temperatures do not exceed 85 deg. C. For outside applications, under conditions of relatively high humidity, Durofilm can be used advantageously. J. Lasnerat. *Bull. Assoc. Technique de l'Industrie Papetiere*, 2, 1-7 (1948) (In French).

The Day Process for Pulping Non-woody Plants

The cellulosic raw materials are subjected to the action of cold nitric acid 30 deg. Bé at less than 15 C. followed by thorough washing to recover acid and subsequent treatment of the pulp with cold alkali. A flow chart shows the sequence of operations and recovery and cost figures are discussed. The process, it is claimed, has the advantage of being able to utilize a wide variety of raw materials, of giving easy bleaching pulps and of obviating the use of the beater. G. Desorbay. *Bull. Assoc. Tech. de l'Ind. Papetiere* 1, 57-9 (1947) (In French).

Unfavorable Influence of Acidity on Paper Quality

Comparative studies were made with test sheets formed bleached sulphite after sizing (a) with 2 per cent rosin and alum at *p*H 4.5 and (b) sizing with 2 per cent resin, 0.5 per cent sodium aluminate and alum at *p*H 7.0. Invariably (b) gave much stronger paper sheets than did (a). The tensile strength (before and after exposure to ultraviolet light) was always higher in the case of technique (b) although in a slightly beaten pulp the differences between the two pulps were less marked. On the other hand the folding endurance of sheets sized with (b) was much greater than that sized by technique (a). These differences also obtained after beating the pulps for 3 days, and when such fillers as barium sulphate and calcium carbonate were added to the stock.

In the case of a sulphite pulp beaten to 45 deg. Schopper-Riegler and treated with 20 per cent barium sulphate, the sample sized by method (a) showed a breaking length of 2840 meters, a burst of 14.5, and only 11 double folds, whereas the same pulp sized under conditions (b) showed respectively 5000 meters, 32.6, and 370.

The author also gives examples of commercial pulps which in the beater showed *p*Hs respectively of 4.5 and 6.7, in which the more acid pulp was decidedly inferior. Less data are available in the case of boards formed at different acidities. However, their quality appears to be unfavorably affected by the lower *p*H. The author discusses very briefly the hydrolysis of alum and the effects of the resulting acidity on the cellulose molecule. M. Chêne. *Bull. Assoc. Tech. de l'Ind. Papetiere*, 1, 74-78 (1947). (In French).

Insecticides from Lignosulphonates

Lignosulphonic acid was oxidized with barium peroxide, and the products saturated with nicotine. Bentonite, silica gel, active carbon or diatomaceous earth could be added as fillers. The products could also be condensed with phenol-formaldehyde in the presence of nicotine. Another possibility is that of forming active salts of barium, copper, mercury, etc. with lignosulphonic acids, suitable for use in insecticides. E. von Drathen and H. Walther. Chem. Ztg. 65, nos. 79-80, 372-3 (1941), through *Bull. Inst. Paper Chemistry*, 18, 238 (1947) (Original in German).

Tensile Strength and Water Sorption of Moist Paper

The author devised two pieces of equipment with the object of standardizing wet strength (A) and water sorption (B) of paper samples. The apparatus in either case is fully described and detailed sketches are included. After a paper sample has been immersed in water, the sample paper strip is subjected to a uniform pressure.

The apparatus for (A) consists of two parts: a boat-shaped hardwood base reinforced with brass and having a polished "prow." The base holds an inlaid bronze plate (C) and a carefully ground bronze plate cover with a suitable handle (D) weighing exactly 910 grams. D fits securely over the plate in C. Each of these plates has the dimensions 3.5 by 26 cm. The paper strip to be tested has the dimensions 1.5 x cm. and after pretreatment is placed between two strips of S. and S. No. 597 filter paper having the same dimensions as those of the bronze plates.

After air-conditioning, the paper samples are dipped into distilled water at 20 C. for 5 seconds using a brass clip weighing 10 grams fastened at the lower end of the strip, so as to insure uniform wetting. After withdrawing, the excess of water is removed from either side of the sample by passing the paper rapidly over the "prow" of base (C), placing the strip between the filters on (C) and weighting it with the overlay (D) for exactly ½ minute. Then the tensile strength is determined immediately and compared with that of a similar (air-conditioned) air-dried sample strip. Usually the strips to be tested are cut from ten similar paper samples (both in the machine and cross directions) and the average wet tensile strength is determined.

In test (B) an apparatus is used which is quite similar to that used for A, excepting that the dimensions of the bronze plates (inlay and overlay) are 7 x 22 cm., and that the top plate weighs 1540 grams. The test is entirely analogous to that used in determining (A) excepting that the conditioned paper strips are 5 x 20 cm. After conditioning for 12 hours each strip is weighed and is then immersed in water at 20 deg. C. for 5 seconds, using a 20 g. clamp (as described above). The excess water is removed and the moist strip is placed between suitable filter papers on the bronze plate and weighted down with the bronze overlay plate for just 30 seconds. The strip is then removed and weighed immediately. Water sorption is computed in terms of per cent increase in weight (based on the weight of the original drystrip). Ten tests are usually made. August Noll. *Wochbl. Papierfabr.* 75, 50-2 (1947) (in German).

Destruction of Auramine Color on the Papermachine

Due to moist heat of the paper machine, as much as 25 percent (or more) of an auramine dye used in coloring paper may be destroyed. The mechanism of this destruction has been studied by the author, who shows that it is due primarily to the hydrolysis of the auramine hydrochloride to ammonium chloride and "Michler's ketone," both of which are practically colorless.

The amount of the destruction may be gauged by determining the ammonium chloride by treatment with formaldehyde to form hexamethylene tetramine and free hydrochloric acid which can then be titrated directly. August Noll. *Wochbl. Papierfabr.* 76, 3 3-4 (1948) (In German).

Frictional and Hydraulic Barking in Central Europe

The author discusses the morphology of wood and bark, variations in bark content and a series (of older) bark analyses. He discusses the methods used in measuring wood, the losses on barking, and the differences in water-driven and rail-transported logs, as well as some of the pretreatments required when dried logs are subjected to frictional barking. The relative efficiency of various types of barkers (including knife barkers) is given in terms of output, power consumption, water and heat requirements, etc.

The author believes that provided the logs are properly preconditioned using heat treatments if necessary, frictional and hydraulic barking may be applied advantageously in Central Europe, especially in the case of logs that have not been water-driven, both from the standpoint of cost and wood losses. The article includes 12 cuts and 56 references. Hermann Wenzl, *Holzforschung* 1, 112-20 (1947) and 2, 12-20 (1948) (In German).

The Georges Varlot Beater

The author discusses the beater patented in April, 1946 (French Patent 912,625), outlining its advantages, its construction, etc. He also gives extensive data regarding efficiency and output. The article is well-illustrated. M. Argy. *Papeterie* 70, 11-16 (1948) (In French).

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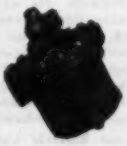

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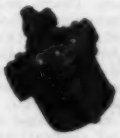

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Bulletin No. 415 for Series T Low Pressure and Vacuum Service Traps. Bulletin No. 315 for Series AE Medium and High Pressure Traps of larger capacities. Bulletin No. 115 for Series 100 Traps of smaller capacities for medium and high pressures and for straight-in-line installation.

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New Catalogues and Publications

Acme Steel Company, 2840 Archer Ave., Chicago 8, Ill.—Process News No. 21 has just come off the press containing several new factual accounts of the uses of Acme Steelstrap. There are interesting facts and photographs on the Steelstrap method of shipping a prefabricated bungalow, and some of the stories tell about the packaging and shipping savings that resulted from the use of Acme materials and tools. A copy may be obtained from the company.

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.—A new 24-page bulletin has just been released by this company describing its large induction motors of the squirrel cage, wound rotor, bracket bearing, and pedestal bearing types. The bulletin charts electrical characteristics, representative full load power factors, and approximate range of starting torques of squirrel cage motors larger than 200 hp. A motor selection chart shows approximate range of standard open, 40° C rise, continuous rated Allis-Chalmers motors with ranges for both bracket and pedestal bearing types. Stator, rotor, and bearing construction of the motors is described, along with some common special features which can be provided with mechanical modifications to suit particular applications. Copies of the bulletin, O5B6132A, are available upon request.

American Abrasive Metals Company, Irvington 11, N.J.—A folder has been issued by this company describing its non-slip products, which cover every industrial requirement. There are numerous photographs and diagrams illustrating the uses of Feralun, Ferrox, Amcolun, Martex, Fera-Mat, and Fera-Flow, which are company trade-names for various floor coverings, stair treads, etc.

E. C. Atkins and Company, Indianapolis, Ind.—A new 60-page book entitled "Tools for the Filing Room" is being circulated by this company, manufacturers of saws and saw tools. It contains many practical suggestions for the use and care of large and small circular and wide and narrow band saws. The company's latest filing room tools are reviewed, and four illustrated pages on welding band saws are also included. The book is available at the above address.

Bausch & Lomb Optical Co., Rochester 2, N.Y.—A new 22-page catalogue, "Bausch & Lomb Photomicrographic Equipment Model L," is now available. The catalogue sets forth the advanced features of this latest piece of equipment, which was designed in response to requests for a universal, medium-sized photomicrographic arrangement. Page headings cover general features, high and low power for transparent specimens, low power lighting set-ups, high and low power for opaque specimens, copying camera, and in the back of the booklet is an order blank and instructions on how to order.

Bowser, Inc., Refrigeration Div., Terryville, Conn.—A new 32-page catalogue illustrating a complete line of temperature, altitude, and humidity simulating units is available to engineers and plant managers. Included in the catalogue are altitude-pressure-temperature curve graphs, thermal property tables for various materials, Fahrenheit table of relative humidity or percent of saturation, and other charts of value in research, testing, and production processing.

Cooper Alloy Foundry Co., Hillside 5, N.J.—The new 80-page catalogue just issued by this company gives complete, concise information on the comprehensive Cooper line of corrosion-resisting stainless steel valves, fittings, and accessories. A handy tab-indexing system enables the busy engineer or purchasing agent to obtain information on prices, dimensions, finished weights, etc., in a moment's notice. Bound with plastic rings and a heavy cover, this catalogue may be obtained by writing the company on your firm letterhead.

Dow Corning Corporation, Midland, Mich.—A new 15-page pamphlet on Dow Corning silicone mold release agents for rubber and plastics has been issued by this company. Information on the general properties of these products is presented, as well as major applications in the fields of lubricating tire molds and curing bags, and in the lubrication of mechanical rubber goods, floor tile, and plastics.

The Duriron Company, Inc., Dayton 1, Ohio—A new bulletin on nickel-molybdenum-chromium alloys introduced about two years ago by this company has just been released. It includes much information on the new Durco alloys, Chlorimet 2 and Chlorimet 3, not previously available. Particular attention is given to its use for sulphuric acid, hydrochloric acid, and salt solutions, and to how it supplements other alloys for these corrosives. Many charts are included on corrosion resistance tests, 120 corrosives altogether being dealt with. For full information, write the company for Bulletin 114.

Electric Machinery Mfg. Co., Minneapolis 13, Minn.—An interesting 20-page booklet, E-M Synchronizer No. 24, has just been published. Some of the valuable information it contains is on coil insulation for large A-C motors . . . new materials and methods, and high inertia loads . . . their motor requirements. Another 20-page booklet, No. 4400-TEC-1078, is concerned with precision control for boiler draft fans with the Regutron Magnetic Drive and discusses principles of operation with graphs, diagrams, and installation pictures. Both booklets are available upon request.

Elliott Company, Jeannette, Pa.—Bulletin C-9 on Type F Surface Condensers has been published by the Condenser Department of this company. Its 16 pages include data on condensate pumps, steam jet ejectors, duplex drainers, air leakage meters, as well as a pressure-temperature conversion table, a chart for determining logarithmic mean temperature difference, and condenser formulas. Numerous photographs of condenser installations and operations are also shown.

General Electric Company, Chemical Dept., Pittsfield, Mass.—Just published is a 30-page illustrated bulletin (No. CDR-57) describing in detail G-E silicone products such as the new silicone resins, oils, greases, water repellents, and rubber, together with their many industrial uses. Charts and tables are included for handy reference. Also issued is an 18-page illustrated booklet (No. CDP-576) which describes briefly the wide range of products manufactured by G-E's Chemical Dept. Products of the company's divisions of plastics, resin and insulation materials, metallurgy, and compounds are described together with their many industrial applications. Copies of both booklets may be obtained by writing the above address.

Byron Jackson Co., Box 2017, Terminal Annex, Los Angeles 54, Calif.—A new 12-page booklet on centrifugal pumps has been prepared by this company which describes several new pumps for the pulp and paper industry, including a new pulp pump, special duty pulp pump, screw feeder pump, milk-of-lime pump, multiplex barking pump, and many others. The booklet is thoroughly illustrated and gives capacities and pressures for all pumps.

William F. Klemp Company, 6601 S. Melvina Ave., Chicago 38, Ill.—A new 23-page catalogue, illustrating and explaining uses of all types of riveted and welded open steel and aluminum flooring, grating, stair treads, catwalks, and structural steel walkways, has just been published by this company. The booklet contains many photographs of the uses and applications of this type of flooring, as well as its many desirable and often necessary features.

Milton Roy Company, 1300 E. Mermaid Rd., Philadelphia 18, Pa.—Users of chemical pumps will be interested in this company's Bulletin No. 484. The capacity-pressure chart featured is a pump selection chart in simplified form and enables a prospective purchaser to ask for quotations on a standard Simplex or Duplex Milton Roy Controlled Volume Pump to handle required volumes up to 20,000 psi. For the bulletin and further information on these pumps, address the company.

Oakite Products, Inc., 22 Thames St., New York 6, N. Y.—The benefits to be gained by the use of specialized cleaning, disinfecting, and deodorizing materials in connection with industrial housekeeping plant sanitation programs are described in an illustrated, 12-page booklet released by this company. The booklet reports on two specific materials, Oakite Di-Sanite and Tri-Sanite, that are said to perform these three functions easily, efficiently, and economically.

Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.—A new steam and water mixer to provide hot water at isolated points is described in Bulletin No. 900. Cutaway photographs in two colors show operation, installation, and construction. The mixer, taking up little space and delivering hot water at the user's pre-determined temperature, eliminated the piping of hot water long distances or installing separate heaters in remote wash rooms or showers.

Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.—Signode's Answer Book, a 28-page pocket-size booklet on how to pack and ship your products with safe, economical protection, has just been published. Filled with ideas for management executives as well as production and shipping men, it illustrates and describes job-proved strapping methods for all kinds of products—from heavy machinery to small packages. Also included is a brief description of Signode's Six-point System of Planned Protection, its unique engineering and research facilities, tools, and two new Signode products—retaining strips and one-piece doors. Free copies will be mailed on request.

Swenson Evaporator Co., Harvey, Ill.—This company, a division of the Whiting Corp., has published Bulletin E-108, "Recovery Equipment for Pulp Mills." In its 28 pages the bulletin features the application of various Swenson products to the recovery problem of pulp mills, such as: pulp washers, evaporators, mud filters, digester blow condensers, spray dryers, etc. It also contains flow sheets and numerous photographs of actual installations. There is an added section on Whiting materials handling equipment and a list of users of Swenson pulp mill equipment.

BOOKS

Modern Packaging Encyclopedia (1948)—More than 60 per cent of this 1200-page book is entirely new material, while the rest of the standard information has been revised and brought up to date. The book is gigantic in its scope and is the only reference book which covers all phases of packaging. It shows why packages are successful, how packages increase sales, how production changes can save money, how the package should be designed and how to avoid trouble in considering the legal aspects of the package itself, making it an invaluable aid for every department of a business which markets a product. The book contains about 670 pages of editorial material, 452 advertisers, and a Buyers' Guide of 90 pages. The price of the book is $6.50, but the buyer is allotted a $2.00 trade-in for his copy of the 1946-1947 Modern Packaging Encyclopedia (returned postpaid), and it may be obtained from the Packaging Catalog Corp., 122 East 42nd Street, New York 17, New York.

Phillips' Paper Trade Directory of the World (1948)—This British publication is an extensive reference to the paper trade of the world with the accent on the British home market. It contains such information as agents and mill representatives, classified makers of paper and millboards, paper trade customs, foreign and colonial classifications, etc. The price of the book is £2. 2. 0., and it is published by S. C. Phillips & Co., Graham House, 3 Tudor St., London, E.C. 4.

Preventive Maintenance in Pulp and Paper Mills—Under this title, the American Pulp and Paper Mill Superintendents Association has issued in book form, a partial record of the proceedings of the General Maintenance Conference held March 25-29, 1946, at the Hotel Manchester, Middletown, Ohio. The conference was conducted under the supervision of the Association. The page size of the book which contains 80 pages is 8½ by 10¾ inches. It is spiral-bound, with a limp fabrikoid cover stamped in gold. It is printed in 10 point bold face type on a good quality of book paper; two columns to the page, with adequate headings and subheadings. There is a complete, and comprehensive index. Subjects covered are: Records, Good Housekeeping, Machines, Lubrication, Electrical Equipment, Piping, and Instruments. The price of the book is $3.00; it may be obtained from H. S. Cobb Printing Company, Westbrook, Maine.

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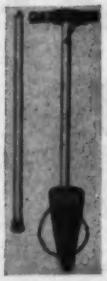
Every paper mill man knows that water-logging, inside film or air-binding can cause a wide variation between the inside and the outside temperatures of drying rolls. And it's the surface temperature on the outside of the rolls that dries the paper. You can locate any off-temperature roll in the train quickly and easily with a Cambridge surface Pyrometer. This accurate, convenient instrument may be used on still or moving rolls. The convenient Extension Model enables you to reach both nearby and inaccessible rolls.



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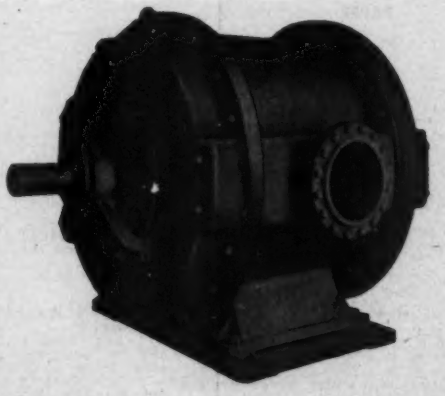

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Menasha, Wisconsin

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CURRENT MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

Quotations to consuming mills, cents per pound or dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Blue Overalls	8.75 to 9.00
Corduroy, Men's	6.25 to 6.50
Corduroy, Ladies'	6.25 to 6.50
Washables, No. 1	5.25 to 5.50
Percales	7.50 to *8.00
Light Prints, No. 1	7.50 to 8.00
Khaki Cuttings—	
Bleachable	7.00 to 7.25
Unbleachable	6.25 to 6.50
New White Canvas	12.00 to 13.00
New Mixed Blacks	5.50 to 6.00
Canton Flannels, Bleached	11.00 to 11.50
Shirt Cuttings—	
New White No. 1	11.00 to 11.50
White Shrunk	10.00 to 10.50
Silesias No. 1	8.50 to 9.00
New Unbleached	11.25 to 11.75
Fancy	6.25 to 6.50
Linen Cuttings—	
American	8.50 to 9.00
White	14.50 to 15.50
Grey	13.50 to 14.50

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	1.75 to 1.80
No. 2	1.65 to 1.70
No. 3 and No. 4	1.45 to 1.55
Twos and Blues—	
Repacked	3.25 to 3.50
Thirds and Blues—	
Repacked	3.00 to 3.25
Miscellaneous	2.50 to 2.75
Whites, No. 1—	
Repacked	4.75 to 5.00
Miscellaneous	4.00 to 4.25
White, No. 2—	
Repacked	3.75 to 4.00
Miscellaneous	3.00 to 3.25

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	7.50 to 8.00
Wool Tares—	
Light	7.75 to 8.00
Heavy	8.25 to 8.50
No. 1 Scrap Bagging	7.00 to 7.50
Manila Rope—	
No. 1 large	6.00 to 6.25
No. 1 small	5.00 to 5.25
Sisal Rope—	
No. 1 large	5.50 to 5.75
No. 1 small	5.00 to 5.25
New Burlap Cuttings	8.00 to 8.50
Jute Threads—	
Foreign (Nom.)	6.50 to 7.00
Domestic	6.00 to 6.50
Strings—	
No. 1 sisal	5.00 to 5.25
No. 2 sisal	4.50 to 4.75
Soft jute	4.25 to 4.50
Mixed	2.50 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	140.00—
Hard White, No. 1	120.00—
Soft White No. 1	100.00—
Soft White, One-cut	120.00—
Soft White, Misc.	90.00—
Fly Leaf, No. 1	55.00—
Fly Leaf, Woody, No. 1	40.00—
No. 2 Mixed Col. Woody	30.00—
Flat Stock—	
No. 1 Heavy Books and Magazines	23.00 to 25.00
Mixed Books	18.00 to 19.00
Ledger Stock—	
No. 1 white	75.00 to 80.00
No. 1 Mixed (Colored)	50.00 to 55.00
Manilas—	
New Env. Cuttings	95.00 to 100.00
New Env. Cuts, One-Cut	—
Extra Manilas	—
Manila Tab Cards, Free of Ground Wood	90.00 to 95.00
Colored Manila Tab Cards	55.00 to 60.00
Kraft—	
New Envelope Cuttings	100.00 to 110.00
Tripled Sorted No. 1 100%	60.00 to 65.00
New 100% Cor. Cuts	65.00 to 70.00
No. 1 Old Assorted	40.00 to 45.00
News—	
White Blank	75.00 to 80.00
Overissue	16.00 to 17.00
No. 1 Baled	12.00 to 13.00
Old Corrugated Containers	16.00 to 18.00
New Jute Corrugated Cuts	27.00 to 28.00
Mill Wrappers	20.00 to 21.00
Box Board Chips	9.00 to 10.00
No. 1 Mixed Paper	9.00 to 10.00

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25—
Ground, cwt.	4.00—
Powdered, cwt.	4.40—
Blanc Fixe—	
Pulp, bulk, ton	77.50—
Dry, barrels	85.00—
Bleaching Powder—	
Drums, cwt.	3.25 to 4.25
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	31.00 to 32.00
Argentine, lb.	28.50 to 29.50
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 15.00
Domestic Coating Bulk (mine) ton	15.00 to 25.00
Imported (ship side) Bulk (lump) ton	22.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.40 to 2.70
Gelatine (silicin), lb.	1.60 to 1.65
Glue, (C.P.) drums, lb.	.39½ to .40
Litharge, powd., bbl., lb.	.19¼ to .20¼
Rosin (Gum)—	
New York, per 100 lbs.	
E	8.00—
F	8.00—
G	8.25—
WW	8.45—
Rosin (Wood), carlots	6.00—
Salt Cake—	
Dom. bulk (wks) ton	23.00 to 28.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	25.00 to ——
Soda Ash—	
Bulk (works), cwt.	1.10 to 1.20
Paper Bags, cwt.	1.25 to 1.35
Barrels, cwt.	1.35 to 1.60
Soda (Caustic)—	
Solid drums, cwt.	2.85 to 3.05
Ground and flake, drums, cwt.	3.25 to 3.50
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.85 to 2.05
40 deg., 35 gal. drums, (works), cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	7.00—
Pearl, barrels, cwt.	7.00—
Paper, (Sp.) bags, cw.	7.00—
Powdered, barrels, cwt.	7.12—
Sulphur (Crude)	
(Mine) bulk, long ton	16.00 to 18.00
Talc—	
Dom. 100 lb. bags (mine) ton	20.00 to 28.00
Canadian	35.00 to 45.00
Titanium Dioxide—	
Barium Pig, bbls., lb.	18 to .18½
Calcium Pig, bbls., lb.	18 to .18½
Zinc Sulphide, bbls., lb.	11.50 to 11.75

WOOD PULP

Prices, dollars per short, air dry, ton, on dock American ports and f.o.b. shipping points with former OPA freight allowances, are:

Bleached sulphite, Swedish	185.00 to 195.00
Bleached sulphite, Finnish	187.50—
Bleached sulphite, dom.	126.00 to 135.00
Easy bleaching sulphite	—
Unbleached sulphite, Swed.	155.00 to 165.00
Unbleached sulphite, Fin.	155.00 to 157.00
Unbleached sulphite, dom.	126.00 to 135.00
Unbleached kraft, Swedish	147.50—
Unbleached kraft, Finn.	147.50—
Unbleached kraft, northern	125.00 to 135.00
Unbleached kraft, southern	110.00 to 125.00
Bleached sulphate, Swedish	185.00 to 190.00
Bleached soda, domestic	130.00 to 135.00
Sulphite screenings, dom.	60.00 to 70.00
Sulphate screenings, dom.	60.00 to 70.00
Groundwood, domestic and Canadian	80.00 to 85.00

PAPER

f.o.b. New York City

Boards—	per ton
Binders	94.00—
Chip	90.00—
Chip, tube and can	95.00—
Chip, full blending	97.50—
Chip, sgl. mla. lined	95.00—
Coated, white patent .016	120.00—
.020 and heavier	110.00—
Kraft liner	79.00—
Filled News	90.00—
Container	90.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	14.25—
B Grade E. F.	13.30—
C Grade E. F.	—
D Grade E. F.	—
No. 2 Uncoated Offset 4 sides, White	—
Machine Coated White (Trimmed 4 sides)	
No. 1 Glossy	19.55—
No. 2 Glossy	18.30—
No. 3 Glossy	17.60—
No. 4 Glossy	—
No. 2 Offset	14.60—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

Writing Papers—f.o.b. mill with name, quantity, packing and other differentials allowed:

Rag Content Bond—

(In Ton Lots)	per cwt.
Extra 100% Rag	48.70—
100% Rag	42.70—
75% Rag	33.10—
50% Rag	28.25—
25% Rag	25.10—

Rag Content Ledger—

(In Ton Lots)	per cwt.
Extra 100% Rag	48.70—
100% Rag	42.70—
75% Rag	33.10—
50% Rag	28.25—
25% Rag	25.10—

Sulphite Bond—

	per cwt.
Air dry, watermarked	—
No. 1 watermarked	18.50—
No. 2 watermarked	17.55—
No. 4 watermarked	16.85—

Sulphite Ledger—

	per cwt. Zone 1
No. 1 watermarked	18.85—
No. 2 watermarked	18.05—
No. 4 watermarked	17.35—

Glassine (f.o.b. mill)—

	per cwt.
Embossed (25 lbs. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof— Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—

News—

	per ton
Rolls, Standard (Contract)	100.00—
Rolls (Spot)	(Nominal)
Sheets	119.00—

Tissues (Carlots)—

	per ream
White No. 1	1.85—
White No. 2	1.75—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	1.85—
Manila	1.60—
Napkins, semi-crepe (12¼ lb. to M shts.) per cs.	.80—
Napkins, full crepe and emb'sed (12¼ lb. to M shts.) per cs.	.80—
Toilet, Bleached (M. shts.) per cs	8.50 to 10.00
Toilet, Unbleached (M. shts.) per cs	8.50 to 10.00

Towels—

	per case
Bleached	4.75—
Unbleached	4.00—

Wrappings (Kraft)—

	per cwt.
Super-Standard	9.00 to—
No. 1 Wrapping	7.25 to 8.00
Standard Wrapping	6.50 to 7.00
Standard Bag	6.50 to 7.00
Variety Bag	—

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)

Bleached Papers—

	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only (10,000 lbs.)	—
Drug wrapp., 35 lb.	—
Unbleached Papers—	
Com. Gr. Butch. 40 lb.	—
No. 1 Butchers	—
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	—
Envp. Mla., Sub. 16-28 (No. 2)	—
Envp. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	—
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B30 lb.	—
Grade A-22 lb.	—

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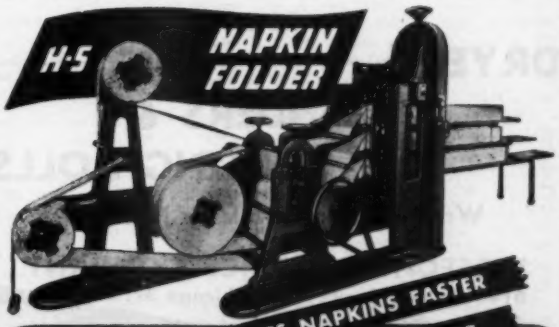

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WANTED—To buy, fully equipped mill producing filter, rice, tissues, etc. State full particulars. Advertiser is principal. Write Box PI-242, 113 W. 42nd St., New York 18, N.Y.

WANTED—Tour Foreman for paper board mill located in northern New Jersey. Excellent working conditions. State age, education, experience, and salary desired. Replies confidential. Address Box 474, Fritz Publications, Inc.

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for all equipment exposed to corrosion by sulphite acids or other corrosive agents
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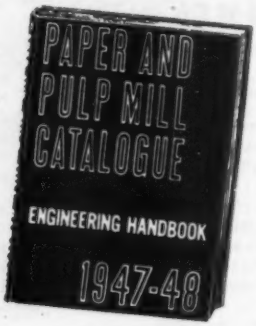

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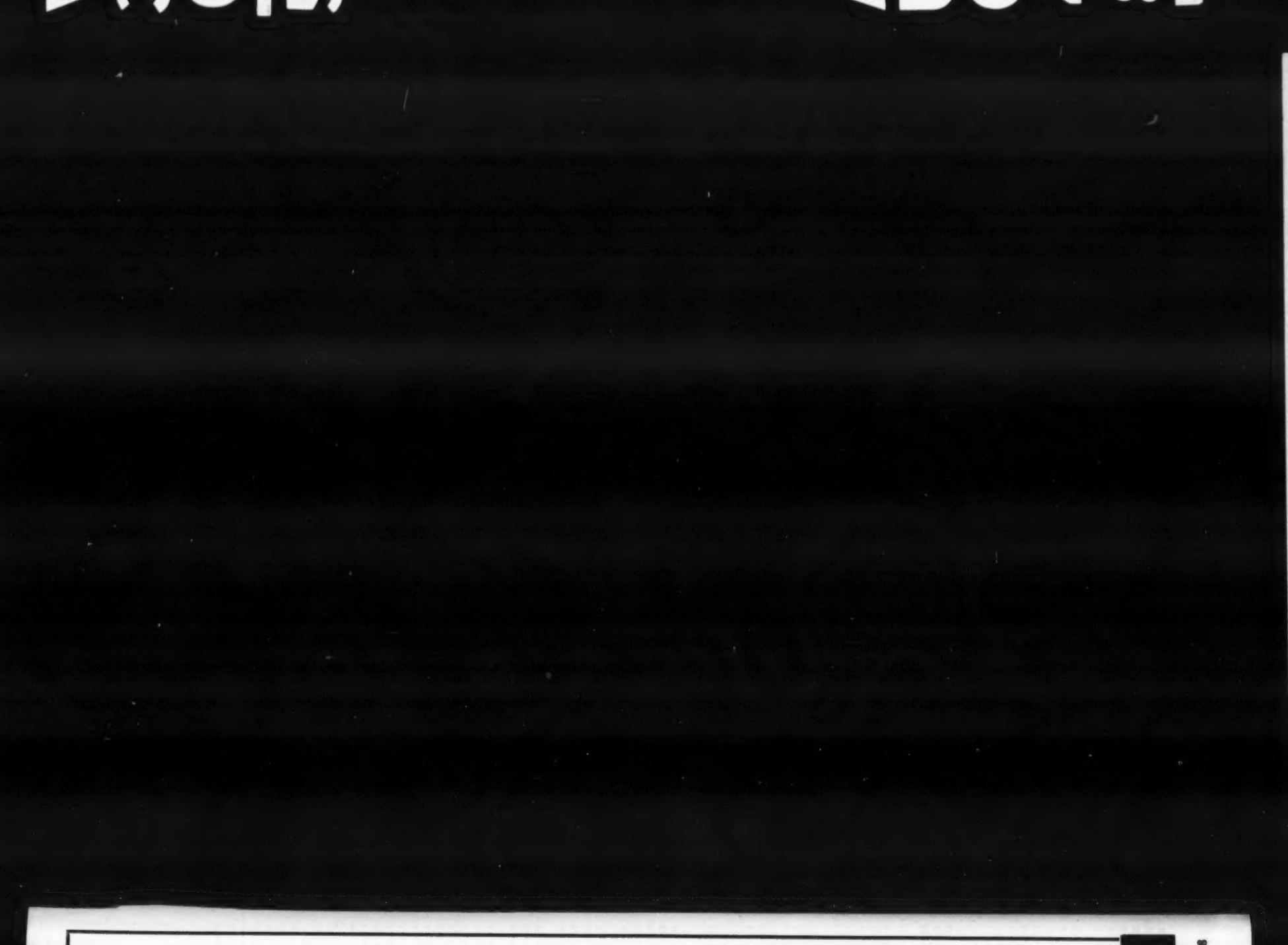

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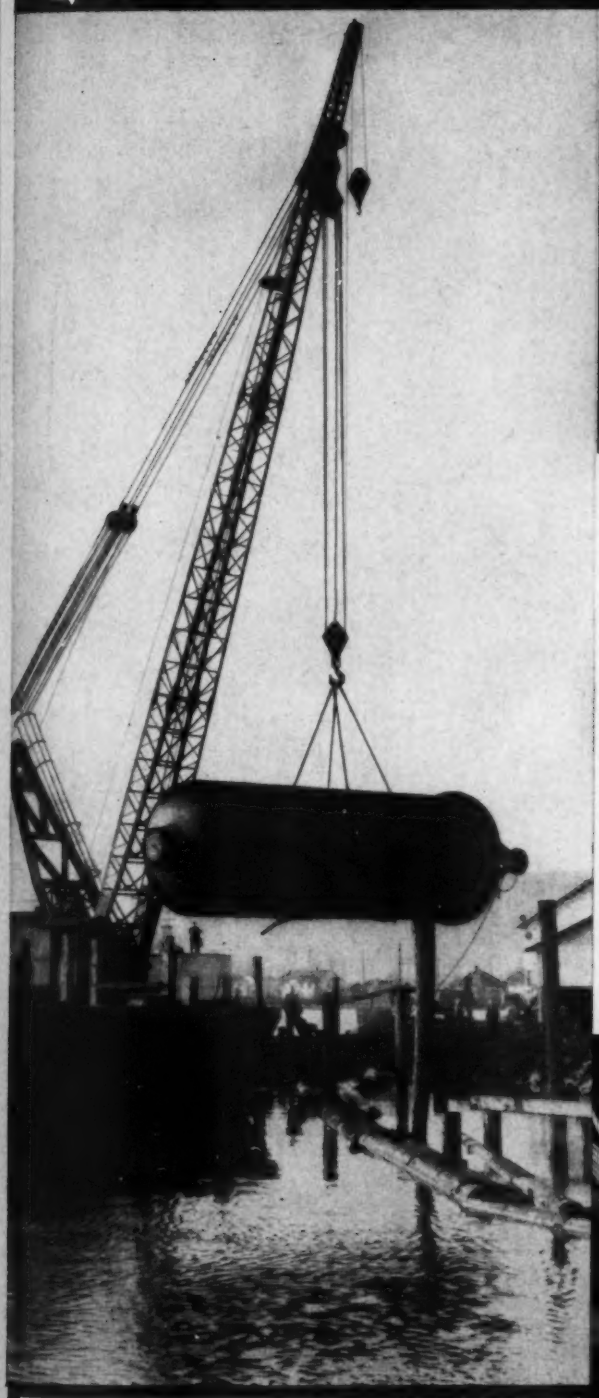

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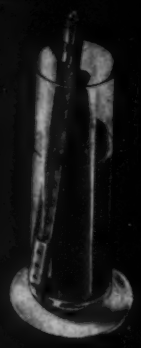

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